



*IBM WebSphere Business  
Modeler V6.2: Process  
Simulation and Analysis*

(Course code WB286 / VB286)

**Instructor Guide**

ERC 1.0

Authorized



**Training**

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# Instructor course overview

This two-day instructor-led course teaches students how to use IBM WebSphere Business Modeler V6.2 to conduct process simulation and analysis, define business measures, and create custom reports.

In this course, students receive training in process simulation and analysis using simulation results, while also experiencing the capabilities of WebSphere Business Modeler's advanced features.

Hands-on lab exercises enable students to setup and run simulation, conduct analysis from simulation results. Students also create custom report, define business measures, and export project from WebSphere Business Modeler.

## Course strategy

### Teaching strategy

Each classroom session uses a combination of facilitated lecture, discussions, group exercises, and demonstrations to convey the material.

### Introduce the material

Inform the students of the objectives of the unit and topic. Give them a brief scenario that will help them understand how the presented material will assist them in performing their jobs.

### Facilitate the learning experience

Involve the students in the learning process. Ask them questions and present classroom scenarios in which students use the available resources to solve situations involving process, procedure, or content on the job.

### Review the material

Review objectives at the conclusion of each unit to ensure that the students have a thorough understanding of the material.

Group exercises and labs are used to reinforce knowledge and skills that the students have learned in the previous classroom topics. The instructor serves as a mentor in checking results, answering questions, and providing constructive feedback and evaluation.

### Course evaluation

Evaluation measures the quality, effectiveness, and impact of the course. It enables students to answer the question, “Are the requirements and objectives of the course being met?”

For all classes, students will provide feedback on course quality by completing an end-of-course questionnaire.

### **Measurement plan**

There are no formal tests administered in the class.

### **Course materials**

- *Student Notebook*
- *Instructor Guide*
- PowerPoint visuals in PDF form to be displayed
- *Student Exercises*
- *Instructor Exercises Guide*

## **Summary of changes in this edition**

The updates made in this version of the course are designed to update the courseware to correspond to Modeler V6.2. Instructor image is no longer required in this course. Both instructor and students are using the same single image.

# Course description

## IBM WebSphere Business Modeler V6.2: Process Simulation and Analysis

**Duration:** 2 days

### Purpose

This two-day instructor-led course teaches students how to use IBM WebSphere Business Modeler V6.2 to conduct process simulation and analysis, define business measures, and create custom reports.

In this course, students receive training in process simulation and analysis using simulation results, while also experiencing the capabilities of WebSphere Business Modeler's advanced features.

Hands-on lab exercises enable students to setup and run simulation, conduct analysis from simulation results. Students also create custom report, define business measures, and export project from WebSphere Business Modeler.

### Audience

This course is designed for:

- Business analysts
- Implementation consultants
- Project managers
- Support engineers
- Sales and marketing professionals
- Customers who need training in process simulation and analysis using WebSphere Business Modeler V6.2

### Prerequisites

Before taking this course, student should complete course WB284 or VB284, IBM WebSphere Business Modeler V6.2: Process Mapping and Analysis.

### Objectives

After completing this course, you should be able to:

- Set up and run a simulation
- Conduct dynamic analysis
- Identify methods for process improvement
- Create custom queries and reports
- Describe the purpose of business measures
- Export projects from WebSphere Business Modeler

# Agenda

## Day 1

- (0:30) Course introduction
- (1:00) Unit 1. Review of process mapping and analysis
- (0:45) Unit 2. Introduction to simulation and analysis
- (0:45) Unit 3. Setting up and running simulations
- (1:00) Exercise 3. Simulation and analysis
- (0:45) Unit 4. Profile and dynamic analysis
- (0:45) Exercise 4. Dynamic analysis
- (0:45) Unit 5. Process improvement
- (0:45) Exercise 5. Process improvement

## Day 2

- (0:45) Unit 6. Custom reports and queries
- (0:45) Exercise 6. Creating a custom report
- (0:45) Unit 7. Defining business measures
- (0:30) Exercise 7. Defining business measures in WebSphere Business Modeler
- (0:45) Unit 8. Exporting from WebSphere Business Modeler
- (0:30) Exercise 8. Exporting from WebSphere Business Modeler
- (0:30) Unit 9. Course review
- (0:15) Unit 10. Course summary





# Unit 1. Review of process mapping and analysis

## Estimated time

00:30

## What this unit is about

This unit describes the Modeler course summary.

## What you should be able to do

After completing this unit, you should be able to:

- Explain the key concepts that were covered in the process mapping and analysis course

## How you will check your progress

- Checkpoint
- Lab exercises

## References

None

## Unit objectives

---

After completing this unit, you should be able to:

- Explain the key concepts that were covered in the process mapping and analysis course

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Figure 1-1. Unit objectives

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

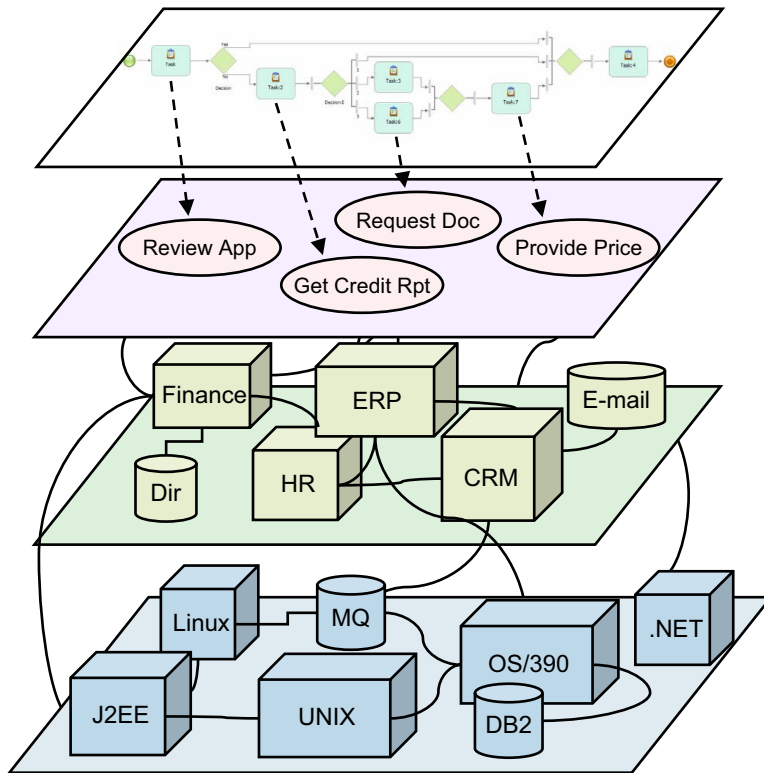
**Purpose** — To introduce the content of this unit.

**Details** —

**Additional information** —

**Transition statement** — Next: The process drives development through the use of business services

# The process drives development through the use of business services



- **Business process layer**

- Cross functional end-to-end loan process
- Manual tasks
- Human tasks
- Business rules tasks
- Service calling tasks

- **Service layer**

- Business Services
- Dynamic Selection Services

- **Application layer**

- Applications, components, software

- **Technology layer**

- Hardware, network
- Connect J2EE to .NET

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Figure 1-2. The process drives development through the use of business services

WB286 / VB2861.0

## Notes:

***Instructor notes:***

**Purpose —**

**Details —** Services provide a business-friendly link between the business processes and IT applications.

**Additional information —**

**Transition statement —** Next: Purposes of business process modeling

## Purposes of business process modeling

---

- Business process models serve many purposes, including:
  - Documenting existing procedures
  - Determining requirements for staff, systems, and facilities
  - Planning changes to existing processes and systems
  - Testing and analyzing existing and proposed processes
  - Identifying defects in your processes (bottlenecks, and so forth)
  - Process model data can support other business applications that rely on this information:
    - Workflow, policy and procedure documentation, application development
- Models visually represent an organization's current workflow (an as-is model) and allow what-if scenarios for future (to-be) designs.
- Effective models need a well designed modeling structure.
  - To understand what it takes to complete the activities
  - Ensures consistent and complete representation of information
    - Including normal operations, alternatives, and exceptions to standards

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Figure 1-3. Purposes of business process modeling

WB286 / VB2861.0

### **Notes:**

Why the process layer -- communication of all parties both business and technology, a solid foundation for the future responsiveness of the enterprise to change. Today's software systems are no longer simple like the dog house; they are more complicated like the skyscraper. It is very difficult to understand them without a model. They are also very expensive to implement; therefore it is important to understand the outcome before you start to build them.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Capabilities of WebSphere Business Modeler

## Capabilities of WebSphere Business Modeler

---

- WebSphere Business Modeler capabilities are central to the understanding of the business process model.
  - **Modeling** allows you to create a graphic diagram or a business process plus all the related process information.
  - **Simulation** supports the time and cost analysis of a process under real-time conditions.
  - **Analysis** provides a number of tools to extract details from the model and from simulation results.
  - **Reporting** creates several documents that can be used to communicate the results of process documentation and analysis.
  - **Code generation** generates code that can be used as a starting point for process automation.

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Figure 1-4. Capabilities of WebSphere Business Modeler

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### **Notes:**

WebSphere Business Modeler has many different capabilities depending on the purpose or objectives.



***Instructor notes:***

**Purpose** —

**Details** — These are the capabilities of WebSphere Business Modeler.

**Additional information** —

**Transition statement** — Next: Modeling modes in WebSphere Business Modeler

## Modeling modes in WebSphere Business Modeler

- Business modeling modes for process mapping:
  - Basic business modeling
  - Advanced business modeling
- Business modeling modes that apply validation rules:
  - WebSphere Business Integration Server Foundation
  - WebSphere MQ Workflow
  - WebSphere Process Server
  - FileNet Business Process Manager
  - WebSphere Business Services Fabric
- When switching modes, the following changes occur:
  - Some options are not available
  - A previously valid model may no longer be valid because of additional validation rules
- No information is lost when switching modes



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Figure 1-5. Modeling modes in WebSphere Business Modeler

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### Notes:

Modeler provides several business modeling modes that filter or reveal information on the model elements or provide validation to support exporting models in a specific format. The mode you choose determines the level of detail you see in diagrams, dialogs, and wizards.

In general, you will use a single mode for all or most of the work you do. If you occasionally want to specify a different level of detail for a model or some aspect within it, you can switch to another business modeling mode.

***Instructor notes:***

**Purpose** — Look at the seven different modeling modes in Modeler. Each serves a different purpose.

**Details** — Emphasize the last bullet (no information is lost when switching modes).

**Additional information** —

**Transition statement** — Each of these modeling modes will be described in more detail in the next two slides.

## Four-pane layout

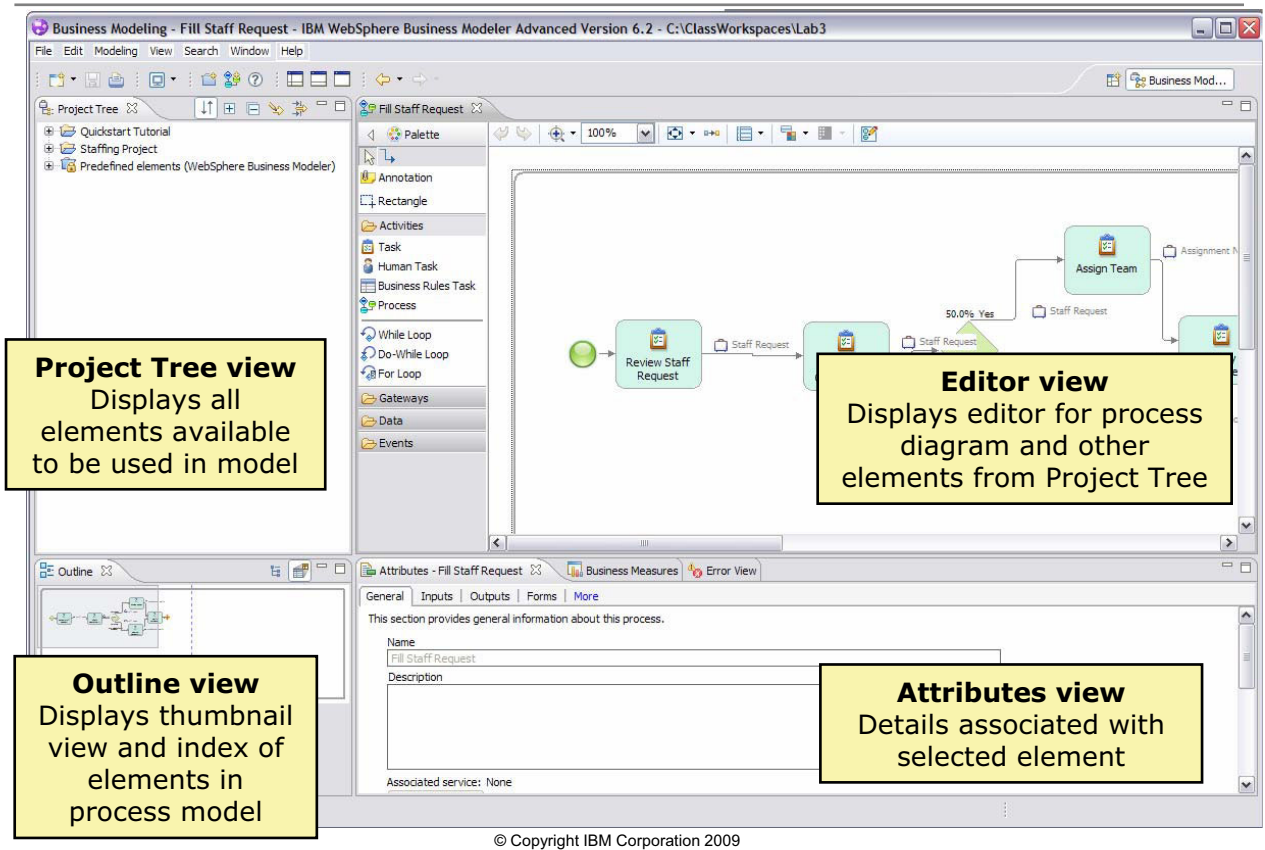


Figure 1-6. Four-pane layout

WB286 / VB2861.0

### Notes:

The number and type of tabs in the attributes view varies by modeling mode.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Primary modeling elements used in Modeler

## Primary modeling elements used in Modeler

Category	Modeler element	Description
<b>Activity</b> Represents the work being performed	Task	Basic unit of work
	Process	Sequence of activities
	Service	Process external to the organization
<b>Data</b> Represents storage area and data map	Repository	Location where business items are stored
	Map	Transforms data from one structure to another
<b>Gateway</b> Determines the process flow	Simple decision	Routes inputs to one of two paths
	Multiple-choice decision	Routes inputs to one of several paths
	Fork	Splits a path into two or more parallel paths
	Merge	Combines two or more paths after an exclusive decision
	Join	Combines two or more parallel paths
	Connection	Links two elements to represent the flow
<b>Event</b> Determines the control flow	Start	Marks the beginning of a process not initiated by another process
	Terminate (Required)	Marks the termination of a process
	End	Marks the end of a path in a process

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Figure 1-7. Primary modeling elements used in Modeler

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### Notes:

***Instructor notes:***

**Purpose** — Identify and define the primary modeling elements in Modeler. This slide introduces the main elements. The next set of slides in this unit will cover these topics in more detail.

**Details** — It is not necessary to spend too much time on this slide. Explain to students that this slide is useful as a summary and more details will be provided in the rest of this unit.

**Additional information** —

**Transition statement** — Next: Adding relevant information to the diagram

## Adding relevant information to the diagram

---

- A model includes a diagram with additional relevant information
  - Information on what is received, worked on, and produced
    - Business items
  - Information about who performs the work and when:
    - Resources
    - Roles
    - Timetables
  - Information on how the company is organized:
    - Organization unit
    - Location
    - Structure
  - Information on grouping related information for analysis:
    - Classifiers
- Information elements are defined and edited using editors opened in the project tree

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Figure 1-8. Adding relevant information to the diagram

WB286 / VB2861.0

### **Notes:**



***Instructor notes:***

**Purpose** — Discuss why it is important to add relevant information to the diagram.

**Details** —

**Additional information** —

**Transition statement** — Next: Additional elements

## Additional elements

---

- These elements serve a specific purpose and make the model more realistic.
- Special purpose tasks
  - Timer
    - Initiates a flow at a specified point in time
  - Broadcaster
    - Publishes a notification
  - Receiver
    - Listens for notifications
  - Observer
    - Watches the repository contents

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Figure 1-9. Additional elements

WB286 / VB2861.0

### **Notes:**

***Instructor notes:*****Purpose —****Details —**

A common use of a timer is to model an automated process that runs every week on a certain day and time, such as a virus checker that runs at noon every Friday. The timer action would be the first action in this process, and it would start a subprocess when the correct time is reached.

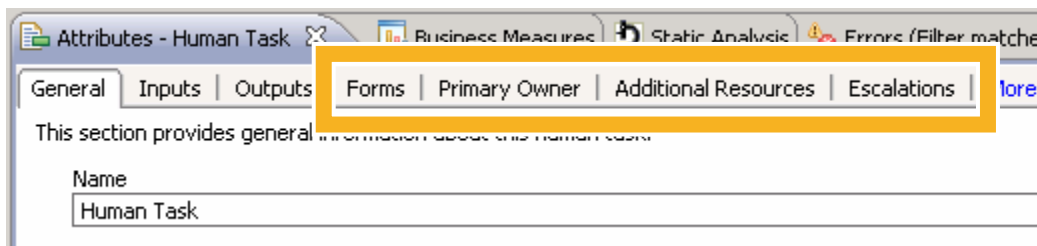
**Additional information —**

**Transition statement —** Next: Human task (1 of 2)



## Human task (1 of 2)

- Specialized task a system assigns to human for completion
  - Used to visually identify and document activities that must be performed by a person
- Can be global or local
  - Local task to local human task conversion
  - Local human task to global human task conversion
- All other normal task attributes
- Treated as a normal task during simulation
  - For process modeling and simulation purposes, you can specify the related cost, revenue, duration, additional resources, organizations, and classifiers



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Figure 1-10. Human task (1 of 2)

WB286 / VB2861.0

### Notes:

To capture the points at which human intervention is needed in a process, you can model the type of human task in which an automated system notifies a person of the need for action.

A human task is a visually distinct, specialized task that you can use to specify who should take responsibility for the activity and what escalation process should take place if the required person is unavailable for a certain amount of time. Because human tasks typically take longer than automated tasks and involve key activities (for example, approving a large loan), it often makes sense to track human tasks in a business activity monitoring application at run time. By adding human tasks to your process models, you can define the requirements for these tasks for both documentation and application development purposes.

In previous releases of WebSphere Business Modeler, if a role or individual resource definition of Person or Staff (or a subtype of these) was assigned to a task, a human task with a potential owner was created during the export to WebSphere Integration Developer. Now that WebSphere Business Modeler provides a human task element, this functionality

has been removed. If you still want these tasks to be exported to WebSphere Integration Developer as human tasks, you can convert them to human tasks or set their implementation type to human task prior to exporting them.

## ***Instructor notes:***

**Purpose** — This slide introduces students to human tasks.

**Details** —

Human tasks are specialized tasks. Note that there are additional attributes that can be assigned to a human task (forms, primary owner, additional resources, and escalations).

Human tasks are tasks that a system assigns to a person for completion. You can use human tasks to visually identify and document activities that must be performed by a human resource. For application development purposes, you can also hand off human task specifications to IT.

In a call center process, for example, you could model a human task for the activity in which a service representative picks up the next customer call from a queue and responds to the customer request. If you created a monitoring application for this business process, you could then monitor the human task to determine how to balance workload among staff members more effectively.

For each human task, you can assign a particular role or resource to work on the task (the primary owner), define escalations that should take place if some aspect of the human task does not complete on time, and associate electronic forms that are required for its completion. You can also generate these forms from the inputs and outputs of the human task.

You can create global (reusable) and local (process-specific) human tasks. You can reuse global human tasks across processes and projects. If you create a global human task, you can export it for use in an application without adding the human task to a process diagram. A local human task corresponds to an inline human task in the generated WS-BPEL process, and enables the business analyst to specify far greater detail about the human task. People assignment criteria enables you to define detailed staff assignment criteria, corresponding with the people assignment criteria in Integration Developer (formerly known as staffing verbs).

Depending on the modeling mode in which you work, you can specify different levels of detail for your human tasks. If you just want to visually identify the human tasks in your process diagrams or document escalations using the name and description of each escalation, you might want to use the Basic modeling mode. You can also provide a description of who the primary owner should be in the Basic modeling mode. If you want to specify who will be assigned the human task at run time or escalation conditions and actions, you need to use the Advanced or WebSphere Process Server modeling mode. However, if you switch from an advanced modeling mode to the Basic mode, some information is filtered out of your view of the human task specification.

For process modeling and simulation purposes, you can specify the related cost, revenue, duration, additional resources (those in addition to the primary owner), organizations, and classifiers for human tasks.

Unlike generic tasks, a human task can have only one input criterion (set of inputs) and one output criterion (set of outputs). You can add an electronic form as the task input, output, or both input and output.

**Additional information —**

**Transition statement —** Next: Human task (2 of 2)

## Human task (2 of 2)

---

- Associate electronic forms that are required for completion
  - Forms integrate the development of the process and the associated computer interface
  - Based on IBM Lotus Forms, Forms Designer, and Forms Viewer
  - Created or imported forms can be reused by other human tasks
  - Forms are exported to WebSphere Integration Developer
- Primary owner
  - Assign a particular role or resource to work on the task
  - Ability to define a criterion (known as a *Verb* in WebSphere Integration Developer) that determines the resource to be allocated as a primary owner
- Escalation
  - Define actions that should take place if some aspect of the human task does not complete on time
- Can have only one input criterion (set of inputs) and one output criterion (set of outputs)

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Figure 1-11. Human task (2 of 2)

WB286 / VB2861.0

### **Notes:**



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Business rules task (1 of 2)



## Business rules task (1 of 2)

- Specialized task
- Represents activities to which business rules apply
- Can be global (reusable) or local (process-specific)
- Used to model complex decisions and to visually identify places in your process model where business policies and practices apply
- Simplifies modeling when a business decision takes the form of a series of if-then statements or a large number of unstructured sentences
- To define rule conditions and actions, use Intermediate, Advanced, or WebSphere Process Server modeling mode

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Figure 1-12. Business rules task (1 of 2)

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### Notes:

When a business decision takes the form of a series of if-then statements or a large number of unstructured sentences, you can use a business rules task to capture the business rules.

Depending on the modeling mode in which you work, you can specify different levels of detail for your business rules. For example, if you want to provide only a name and description for each business rule, you might want to use the Basic modeling mode. If you want to define rule conditions and actions for your business rules, you need to use the Intermediate, Advanced, or WebSphere Process Server modeling mode. However, if you switch from a more advanced modeling mode to the Basic mode, some information is filtered out of your view of the business rules.

As you can for other tasks, you can specify the related cost, revenue, duration, inputs, outputs, resources, organizations, and classifiers for business rules tasks. However, a business rules task can have only one set of inputs and outputs. Other than the task inputs and outputs, these additional task specifications apply to process modeling only. You can use this modeling information to run a simulation that treats the business rules task like a

generic task (that is, the rule logic defined for the business rules task is not run as part of the simulation). The task information required for simulation is not included with the business rules when you export a business rules task from WebSphere Business Modeler. You can define one or more business rules for a business rules task, and you can schedule when these business rules should take effect.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Business rules task (2 of 2)

## Business rules task (2 of 2)

- Business rule
  - Simple if-then logic
  - If a condition evaluates to true, then actions are invoked
- Business rule template
  - Create a rule template to reuse rule conditions and actions, or allow their parameter values to be changed in an application at run time

Attributes - Business Rules Task | Business Measures

General | Cost and Revenue | Duration | Inputs | Outputs | **Business Rules** | sources | Organizations | Classifiers | More

**Business rules**  
Identify the high-level business rules associated with the task.

Business rule	Description

Add  
Edit...  
Remove

**Scheduling**  
Specify which business rule should be used by default and which business rules are in effect on specific dates. Dates are set in local time zones, so the scheduling of business rules in an application at runtime occurs in the local time zone.

Default business rule

**Scheduled business rules**

Start date	End date	Business rule

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Figure 1-13. Business rules task (2 of 2)

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### Notes:

***Instructor notes:***

**Purpose —**

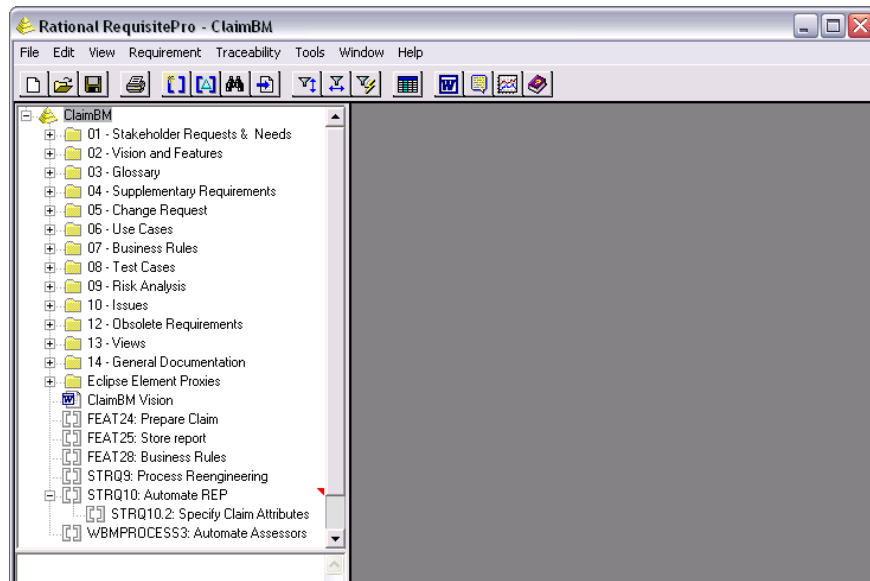
**Details —**

**Additional information —**

**Transition statement —** Next: Benefits of using Rational RequisitePro

## Benefits of using Rational RequisitePro

- Single, centralized requirement collection point for all requirements.
  - Provides a unified interface with which to analyze and compare requirements
- Trace requirements to line items
- Share more information with your development teams about the requirements



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Figure 1-14. Benefits of using Rational RequisitePro

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### Notes:

## ***Instructor notes:***

**Purpose** — This slide explains the benefits of using Rational RequisitePro in a development project.

### **Details** —

There are three benefits you will see from using RequisitePro to align the project efforts more closely with your customer's requirements.

The first benefit is creating a single, centralized requirement collection point for all of your requirements. This gives your plan team a unified interface with which to analyze and compare *all* of the requirements (from both customers and internal sources).

Secondly, RequisitePro enables you to trace requirements to line items. This allows you to keep your plan extremely close to your customer's requirements. Of course, line items are *based* on requirements, but this relationship is rarely documented or stored in a consistent manner. Often this information is only recorded in the memories of the plan team.

Traceability, on the other hand, provides you with an easy method to feed back information about a requirement to the customer who submitted it. Additionally, if a requirement changes the link will be marked as suspect, and you will know that you must check to see if the line item also needs to be updated.

The third benefit of using RequisitePro is that it shares more information with your development teams about the requirements that are the basis for the work they are doing. The team can gain many insights by looking back at what it was that the customer, marketing, or the strategy team originally asked for.

### **Additional information** —

**Transition statement** — Next: Validation fundamentals



## Validation fundamentals

---

- **Syntax:** Model constructs are correct and valid.
  - Is the model properly constructed to provide valid results in the Modeler?
- **Semantics:** The meaning of the model is correct — task attributes, organizations, roles, sequence of tasks.
  - Does the model created reflect what is occurring in the business, or what could occur in the business?
  - Is it thorough; was any data left out?
- **Sense:** The model is business relevant; cost (time and money) assumptions and their causes are valid.
  - Does it make sense that the model and resulting analysis show on average that it takes three weeks to process a claim when company metrics would suggest one week?
- **Standards:** The model adheres to the defined modeling standards — constructs, naming conventions.
  - Will the model be able to be understood by someone who was not involved with its creation?

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Figure 1-15. Validation fundamentals

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

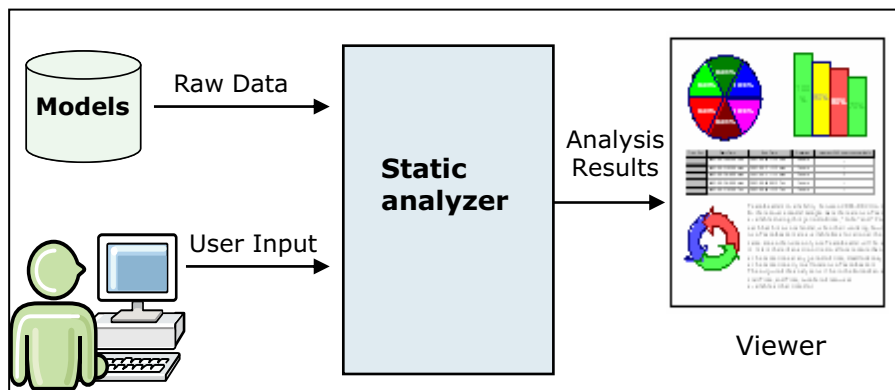
**Details —** Without constantly validating the process, you could potentially go off in the wrong direction.

**Additional information —**

**Transition statement —** Next: Static analysis overview

## Static analysis overview

- Gives business users important information computed from the raw data in the models:
  - Cost
  - Time
  - Performance
  - Improvement capabilities
  - Process flow validity
  - Resources leveling
  - Qualified resources to play important roles
- Inputs are raw model data and parameters entered by the user.
- Results are viewed using either a tabular or graphical viewer.
  - Results can be printed using predefined report templates.



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Figure 1-16. Static analysis overview

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### Notes:

## ***Instructor notes:***

### **Purpose —**

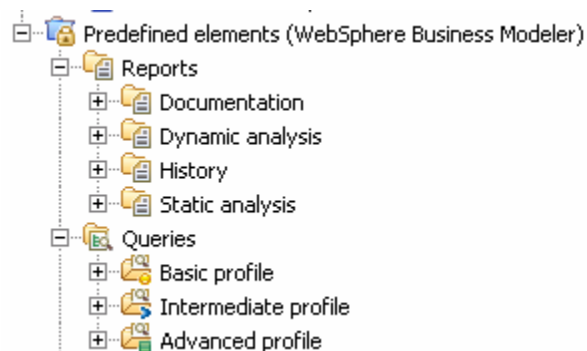
**Details —** Raw input is what you entered in the model. Parameters are what is entered by the user.

### **Additional information —**

**Transition statement —** Next: Querying, reporting, and printing

## Querying, reporting, and printing

- Queries enable you to extract and view selected information on elements of your models
- Reports are a formatted presentation of information relating to a model or to the results of analyzing a process simulation.
- Reports can be viewed, printed, or exported
- Reports versus queries
  - All predefined queries have a corresponding predefined report based on the query.
    - Use the query to view the information.
    - Use the report if you want to format, print, or save the information
- Diagrams can also be printed or exported



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Figure 1-17. Querying, reporting, and printing

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

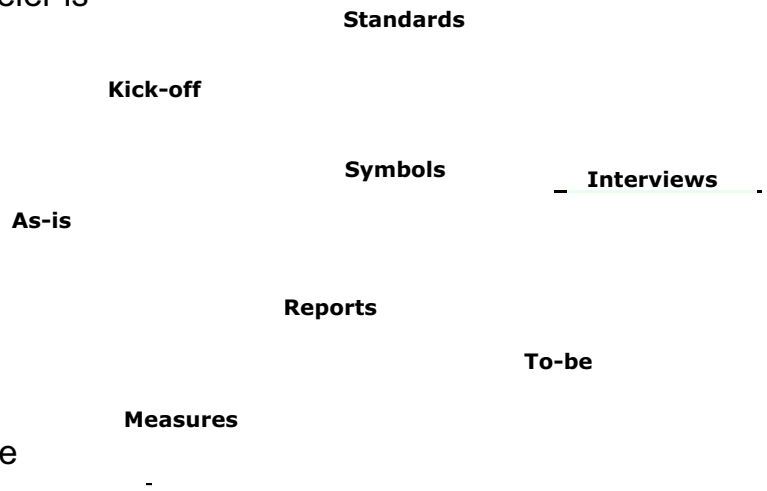
**Details —**

**Additional information —**

**Transition statement —** Next: Defining standards and agreeing to best practices

## Defining standards and agreeing to best practices

- Your stakeholders will also help you define the standards and gain the agreement required to maintain best practices:
  - WebSphere Business Modeler is methodology independent, but successful modeling efforts require a level of standardization and a defined approach.
  - Process modeling standards:
    - It is necessary to define the use, creation, and implementation of the symbols, definitions, and data descriptions.



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Figure 1-18. Defining standards and agreeing to best practices

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### Notes:

***Instructor notes:***

**Purpose** — Use the right tool to do the right job.

**Details** — You can use a hammer to cut (break) wood, but it is best to use a saw.

**Additional information** —

**Transition statement** — A good tool is important, but you have to provide some instructions on how to use it properly to be most effective.



## Need for project versioning

---

- To distribute the effort of modeling or modifying an entire project among multiple team members.
  - Members can view and post project artifacts to a version control system.
  - Check out processes and create their local versions.
    - Submit their changes back when done
- Modeler can use IBM ClearCase or Concurrent Versions System (CVS) to access a version control repository on a server.
  - Maintain secured version control of project data in the repository
  - Each modification of a project element (such as process, resource, or catalog) stored as a distinct version of the original item
  - Post business modeling projects to share, view, make copies of the shared projects, and save the copies to their local machine
  - View the history of project element modifications
  - Compare two or more versions of the same item

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Figure 1-19. Need for project versioning

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

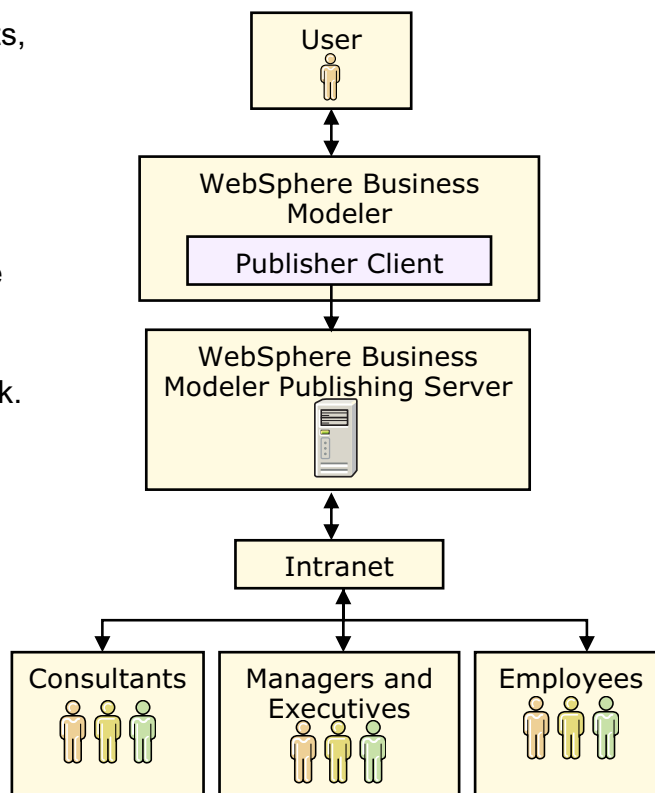
**Details —** Version control is important because a process model tends to be large and cover multiple areas of business with multiple analysts working on it.

**Additional information —**

**Transition statement —** Next: How users interact with publishing server

## How users interact with publishing server

- Users may include business analysts, consultants, or process engineers.
- Reviewers may include executives, consultants, employees, partners, and even customers.
- Reviewers validate the data used to create the process model or provide feedback.
- Users make adjustments to the process based on reviewer feedback.
- Publish a single model element, a complete catalog, or the entire process model project.
- The reviewers can then comment on the updated process model or respond to comments.
- This creates an environment for continuous improvement of the process model.



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Figure 1-20. How users interact with publishing server

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### Notes:

Users of WebSphere Business Modeler Publishing Server can interact with a publishing server using publisher clients and Web browser clients.

Users who have WebSphere Business Modeler can use its publisher client to send business processes to a publishing server. Users with Web browsers can be reviewers who validate the data used to create the process model or provide feedback so that the modeling team can update the model or people who want to reference the process model for information. These users may include executives, consultants, employees, partners, and even customers.

***Instructor notes:***

**Purpose —**

**Details —** Many people now have paperless access to the process models.

**Additional information —**

**Transition statement —** Next: Importing from Microsoft Visio

## Importing from Microsoft Visio

---

- Import shapes from Microsoft Visio files from Microsoft Visio 2002 or newer.
- These shapes can be used to create elements such as tasks and business items in Business Modeler.
- Predefined mappings include all shapes from the Basic Flowchart stencil, IDEF0 stencil, and SDL Diagram stencil.
- Customize your own mappings.

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Figure 1-21. Importing from Microsoft Visio

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### **Notes:**

***Instructor notes:***

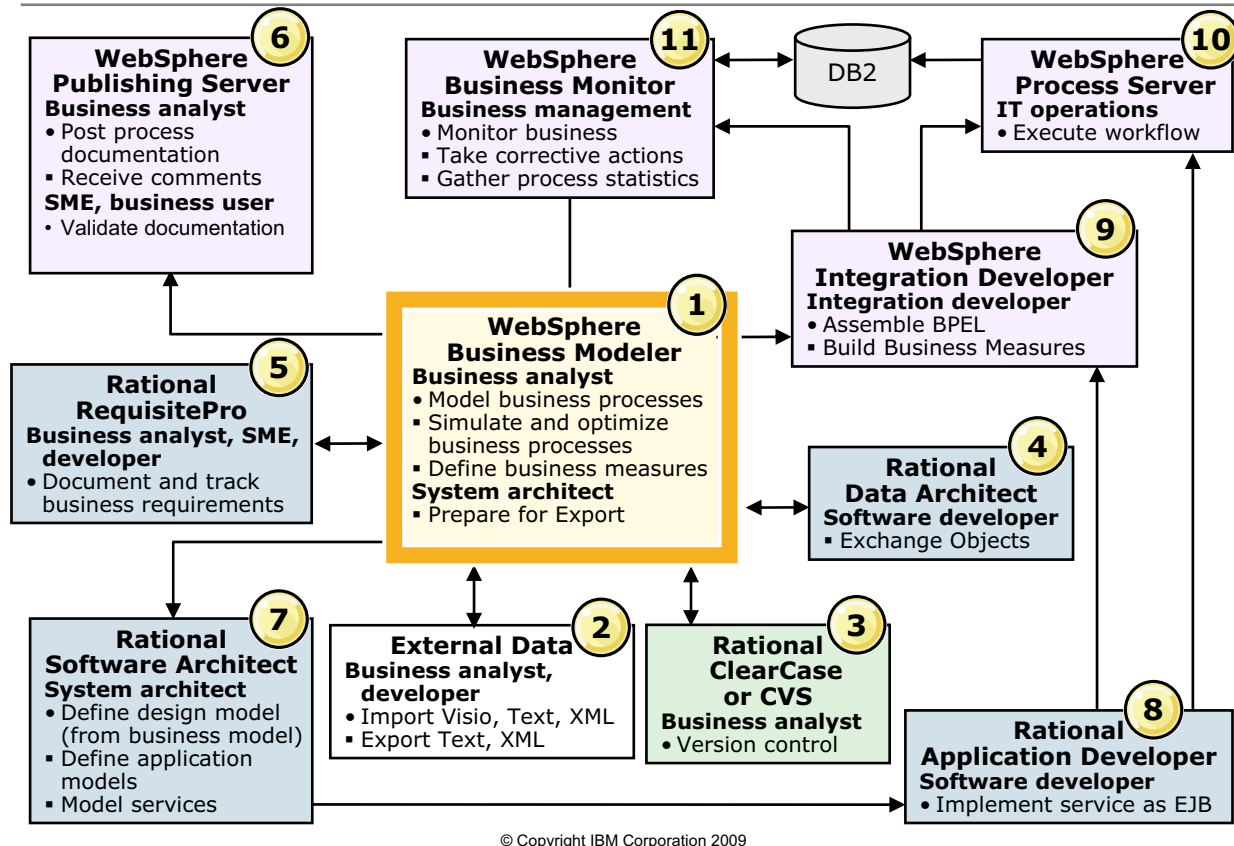
**Purpose —**

**Details —** If you do not have the correct version of Visio, you can get one license and just open and close each model.

**Additional information —**

**Transition statement —** Next: What is process simulation?

## Modeler's relationship with other products covered in this course



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Figure 1-22. Modeler's relationship with other products covered in this course

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### Notes:

This slide shows the integration between WebSphere Business Modeler and other IBM and non-IBM products. The numbers on this slide do NOT represent a sequence of events.

1. A process model is built using existing information or future design information in WebSphere Business Modeler.
2. Supporting information can be imported (existing Visio models, business items, business services) to support the development of the model.
3. Versions of the process model are stored in a repository for security and control using Rational ClearCase or CVS.
4. Additional IT information can be imported from Rational Data Architect to support development.
5. Business requirements are synchronized with the process model using Rational RequisitePro.
6. Models are exported to WebSphere Publishing Server for review (using a Web browser) during development and later in production.

7. When the new process is ready for development, UML models for building new services are exported to Rational Software Architect.
8. Once the software design is done, the code is developed in Rational Application Developer and exported for further development and execution.
9. Workflow code is developed in WebSphere Integration Developer using the BPEL code generated from the model and using the WSDLs interfaces that were developed. The completed code is exported for execution and monitoring.
10. The workflow code is executed on WebSphere Process Server and production data is exported for monitoring and reporting.
11. Production data is monitored by management using WebSphere Business Monitor. Production data can be exported from WebSphere Business Monitor and imported into WebSphere Business Modeler for future analysis.



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Additional materials in your class image

## Unit summary

---

Having completed this unit, you should be able to:

- Explain the key concepts that were covered in the process mapping and analysis course

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Figure 1-23. Unit summary

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —**



## Unit 2. Introduction to simulation and analysis

### Estimated time

00:45

### What this unit is about

This unit describes the introduction to simulation and analysis

### What you should be able to do

After completing this unit, you should be able to:

- Explain business process analysis
- Describe the purpose of simulation
- Define simulation terminology

### How you will check your progress

- Checkpoint
- Lab exercises

### References

None

## Unit objectives

---

After completing this unit, you should be able to:

- Explain business process analysis
- Describe the purpose of simulation
- Define simulation terminology

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Figure 2-1. Unit objectives

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### **Notes:**

***Instructor notes:***

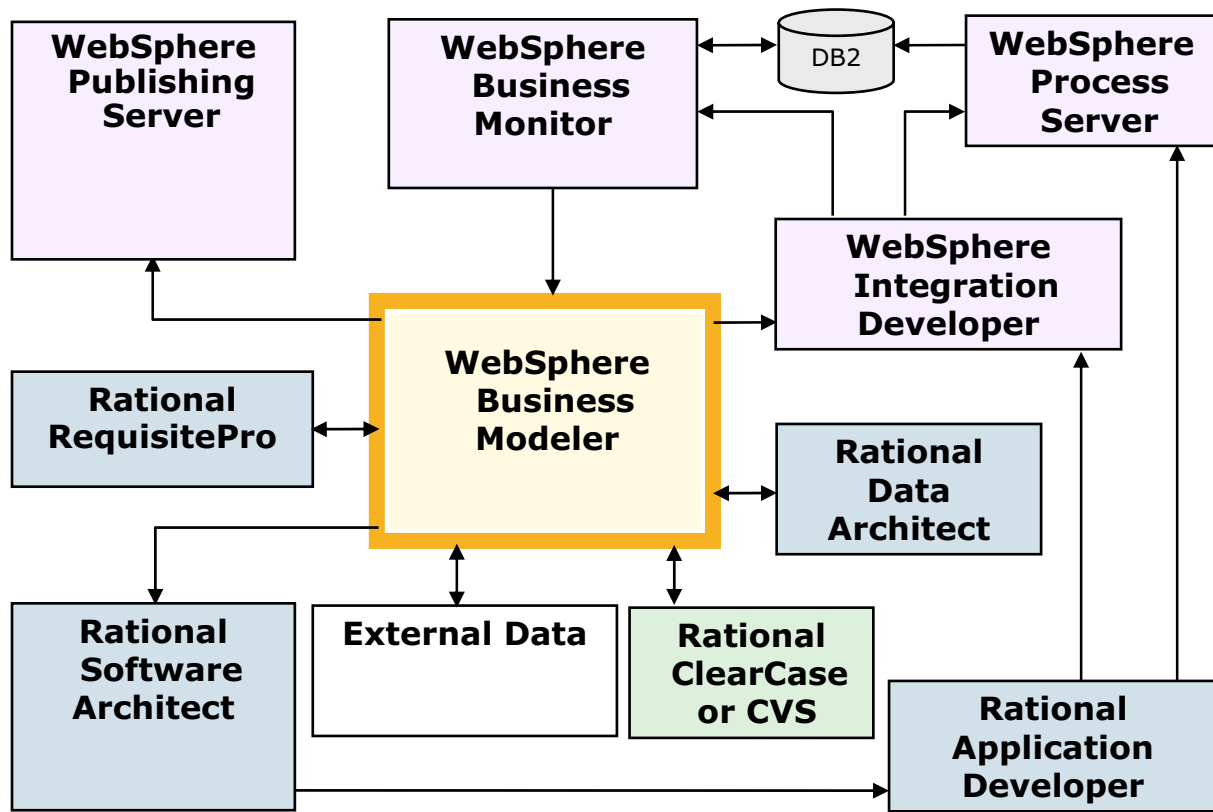
**Purpose** — To introduce the content of this unit.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation and analysis are core Modeler features

## Simulation and analysis are core Modeler features



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Figure 2-2. Simulation and analysis are core Modeler features

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### Notes:



***Instructor notes:***

**Purpose —**

**Details —** This diagram will be used to position the different units throughout the course.

**Additional information —**

**Transition statement —** Next: Business process analysis

## Business process analysis

---

- An analysis discipline focused on how an organization:
  - Reduces overall costs
  - Effectively uses its resources
  - Supports its customers better
- Takes an end-to-end view of the business
- Closely related to requirements definition
  - Changes to policies, processes, and information systems
- Key to business process management
  - Making process more efficient, effective, and adaptable
- Based on simulating a process under real-life conditions
  - Varying times, costs, schedules, and resources

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Figure 2-3. Business process analysis

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### **Notes:**

***Instructor notes:***

**Purpose** — Define the purpose of business process analysis.

**Details** —

**Additional information** —

**Transition statement** — Next: What is process simulation?

## What is process simulation?

---

- Simulation:
  - The imitative representation of the functioning of one system or process by means of the functioning of another (a computer simulation of an industrial process). — Merriam-Webster
- Process simulation:
  - Using a computer program based on a set of mathematical formulas to imitate the behavior of a business process to determine how it behaves under different conditions.
  - If the model behaves in the same manner as the real process:
    - There is a good chance that the underlying variables are correct.
    - The model can be used to test the impact of changing conditions.
- Process simulation is a simulated performance of a real-world business process in a virtual environment.
  - The business process might be a model of:
    - An existing business process.
    - One that is planned for the future.

---

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Figure 2-4. What is process simulation?

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### **Notes:**

***Instructor notes:***

**Purpose** — Define the function of simulation.

**Details** —

**Additional information** —

**Transition statement** — Next: The value of simulating business processes

## The value of simulating business processes

---

- Simulation is a core component of WebSphere Business Modeler.
  - Can run simulations of non-business processes with limitations
- Simulations can be used to:
  - Observe a process in action
  - Examine the statistics generated by a process as it runs
  - Perform analysis on the simulation results (dynamic analysis)
- Changing a diagram or other model elements allows comparative analysis.
  - Quantify the effects of the changes
    - Assess the costs and benefits of changing your business processes
  - Observe how a process will perform in response to variations on inputs to the process
    - Vary process input volume over time

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Figure 2-5. The value of simulating business processes

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### **Notes:**

***Instructor notes:***

**Purpose** — Simulating allows you to assess the performance of the process, generate statistics, and pinpoint potential areas of improvement.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation terminology (1)

## Simulation terminology (1)

---

- Simulation snapshot:
  - A record of the model that will be simulated
- Simulation profile:
  - A record of the model plus the simulation attributes
- Statistics and results:
  - The information produced by the simulation
- Probabilities or expressions:
  - The way decisions are handled during a simulation
- Tokens:
  - Representations of units of work passing through the process

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Figure 2-6. Simulation terminology (1)

WB286 / VB2861.0

### **Notes:**



***Instructor notes:***

**Purpose** — Introduce the simulation terminology.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation terminology (2)

## Simulation terminology (2)

---

- Process instances:
  - Each execution of a process simulation
- Process cases:
  - Each path through a process
- Random number generation:
  - The introduction of real-life variability into a simulation

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Figure 2-7. Simulation terminology (2)

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose** — Introduce the simulation terminology.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation snapshots

## Simulation snapshots

---

- A record of the complete process model at the moment you ran a simulation of the process.
  - A copy of all the elements in the project that the process uses
    - Business items, resources, and global tasks
- Need to create multiple snapshots for each set of changes to compare the effects of those changes.
- Elements created by a snapshot:
  - Simulation snapshot settings
  - Simulation profile
- Once a snapshot is created, the changes to the original model will not be reflected in the snapshot.
  - To include changes, a new snapshot needs to be generated.

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Figure 2-8. Simulation snapshots

WB286 / VB2861.0

### **Notes:**

**Instructor notes:****Purpose —**

**Details —** When you simulate a process, the tool adds a simulation snapshot in the Project Tree view as a child element of the process. A simulation snapshot is a record of the complete process model at the moment when you simulated the process. This record contains a copy of all the elements of your project that the process uses, such as business items, resources, and global tasks. You might want to create multiple simulation snapshots for the same process after making changes to the project or to the process itself so that you can compare the effects of these changes.

**Additional information —**

**Transition statement —** Next: Simulation profiles

## Simulation profiles

---

- A simulation profile is a copy of a process model augmented with simulation attributes used to run the simulation.
  - The profile is based on the process model at the time the snapshot was created.
- Attribute values you set in a simulation profile are used when you analyze the profile or run a simulation.
  - Attributes are copies of snapshot settings: token creation, cost, revenue, duration, and resource requirements.
  - Attributes can override values inherited from the simulation snapshot.
- Multiple simulation profiles can be created for a single simulation snapshot.
  - Compare the results of your process in different “what-if” business scenarios
    - For example, increase in volume
- You can add breakpoints and interrupts to a simulation profile to cause a process to pause in the middle of a simulation run.
  - Breakpoint pauses the simulation run when that activity is activated by an incoming token.
  - An interrupt pauses the simulation run when a specified condition occurs.

---

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Figure 2-9. Simulation profiles

WB286 / VB2861.0

### **Notes:**

***Instructor notes:*****Purpose —**

**Details —** A simulation profile is a copy of a process model augmented with simulation attributes that you use to run the simulation. Each simulation profile that you create for a simulation snapshot is based on the process model as it existed when the simulation snapshot was created.

**Additional information —**

**Transition statement —** Next: Statistics and results

## Statistics and results

---

- Simulations provide two kinds of information about processes:
  - Simulation statistics are generated while the simulation is running.
  - Simulation results are compiled when the simulation has completed.
  - You can enable or disable the collection of statistics and results in the simulation control panel.
- Simulation statistics are details about the instances of processes, tasks, and connections.
  - The simulation control panel displays simulation statistics on the Processes, Tasks, and Connections tabs.
  - Statistics are constantly updated while the simulation is in progress.
  - Choose to display either:
    - Statistics for individual process instances
    - Collected statistics based on all process instances
- Simulation results are sets of data recorded during each simulation run and are used in dynamic analyses.
  - Results are stored in a database.
  - A results node is added to the Project Tree as a child of the simulation profile.
    - Each run produces its own simulation results node.

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Figure 2-10. Statistics and results

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### **Notes:**



***Instructor notes:*****Purpose —**

**Details —** Simulations provide two kinds of information about processes: simulation statistics that are generated while the simulation is running, and simulation results that are compiled when the simulation has completed.

**Additional information —**

**Transition statement —** Next: Probabilities and expressions (1)

## Probabilities and expressions (1)

---

- Profiles can be set up to use one of two different methods of selecting a path:
  - Probabilities are specified in the attributes as percentages.
  - Expressions are created with the expression editor.
- Probabilities:
  - Probabilities allow you to set up and run a simulation more quickly.
    - Relatively little data setup in a model
  - Specify probabilities on decision choices, loops, and task outputs.
  - Sufficient to perform most simulations.
    - Except for very detailed low-level analysis
  - Use probability-based simulation for current state modeling and possible future state analysis.

---

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Figure 2-11. Probabilities and expressions (1)

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### **Notes:**

***Instructor notes:*****Purpose —**

**Details —** Probability-based simulation enables you to set up and run a simulation more quickly. Probabilities require relatively little data setup in a model. In most cases you will specify probabilities on decision choices, loops, and task outputs. Probabilities are sufficient to perform most simulations, except when very detailed low-level analysis is required. Typically, you can use probability-based simulation for current state modeling and possible future state analysis.

**Additional information —**

**Transition statement —** Next: Probabilities and expressions (2)

## Probabilities and expressions (2)

---

- Expressions:
  - The expression editor is required to create an expression for each possible path.
  - Used for:
    - Low-level future state business models
    - Models that clearly define the interfaces in and out of tasks and other elements
- Expressions specify how specific data will be treated as it passes through the process.
  - For example, an order might be handled differently depending on the customer type or depending on the total cost of the order.
    - Business item creation rules could be used to determine the specifics of each order.
    - Expressions on decisions and activities evaluate the incoming order and handle it according to the specific details it contains.

---

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Figure 2-12. Probabilities and expressions (2)

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Tokens

## Tokens

---

- A token represents a unit of work that is received by a process and transferred between different activities in the process flow.
  - Some tokens represent the transfer of data between activities, while other tokens represent only a transfer of control.
- Token creation settings define the quantity and rate of inputs that the process receives in a simulation run.
  - The frequency can be generated at a constant rate or a statistically distributed rate.
  - The number of tokens can be generated individually or in bundles.
- A large number of tokens may have to be run through a process to achieve a statistically significant simulation result that can be used for dynamic analysis.
  - One formula that can be used to determine the minimum number of tokens to use in a probability based simulation is:
    - Number of cases multiplied by (highest case probability / lowest case probability)

---

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Figure 2-13. Tokens

WB286 / VB2861.0

### **Notes:**

***Instructor notes:*****Purpose —**

**Details —** For a process simulation to run, the process must receive one or more inputs. These inputs to a process must be associated with data. In a simulation profile, inputs to the process and to activities within the process are represented by tokens. Some tokens represent the transfer of data between activities, while other tokens represent only a transfer of control.

**Additional information —**

**Transition statement —** Next: Process instances

## Process instances

---

- A process instance is a unique occurrence of the process during simulation.
- Arrival of tokens initiates a process instance defined by a model.
  - The process run either completes successfully or fails.
  - For example, in a model of a call center, a process instance represents the handling of a call from an individual customer.
- Instance analysis looks at the activities within a particular instance of a process that is created during a simulation run.
- Aggregated analysis looks at specific elements within a process aggregated across all process instances in a simulation run.
- A task instance is the execution of a specific task within a process instance.

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Figure 2-14. Process instances

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### **Notes:**



***Instructor notes:*****Purpose —**

**Details —** Perform process instance analysis to get a detailed understanding of each individual pass through a process during simulation.

**Additional information —**

**Transition statement —** Next: Process cases

## Process cases

---

- A process case is a path a process instance can take.
- In a process case, units of work follow a particular pattern of connections and activities through a branching process flow.
  - The path followed during simulation is determined by probabilities or expressions.
- Cases include both the main paths and all the exception paths.
- The greater the number of cases, the larger the number of tokens that need to be generated for a statistically significant result.
- Analyzing the process cases helps identify the variations in performance between different patterns of process flow.
  - Individual cases may have a significant effect on the overall process.

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Figure 2-15. Process cases

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### **Notes:**

***Instructor notes:*****Purpose —**

**Details —** A process case is a form that a process instance can take, in which units of work follow a particular pattern of connections and activities within a branching process flow.

Process case analyses show weighted average values for the results of simulated processes, where the average value is weighted for each process case to account for the distribution of process instances to that case, relative to other cases.

**Additional information —**

**Transition statement —** Next: Random number generator

## Random number generator

---

- A **random number generator** is a computational or physical device designed to generate a sequence of numbers that lack any pattern.
- Random numbers are used to drive the variation in frequencies, times, and costs.
- Statistical distributions can be used to generate the values used in the model calculations.
- A random number seed is used to start the random number generation.
  - You can control the random number seed.
- The random pattern makes the model more realistic.
  - For example, you may say an order comes on average once every five minutes, but in reality the time between orders is continually varying.

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Figure 2-16. Random number generator

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose** — Look at the definition of random number generator, which is used during the simulation in Modeler.

**Details** —

**Additional information** —

**Transition statement** — Next: Random number seed (1)

## Random number seed (1)

---

- The random number seed is the starting point for a series of numbers.
  - This setting defines a random number, which determines a fixed starting point for the sequence of random values that are used in a simulation.
    - Setting a random number seed other than zero makes it possible to precisely reproduce a simulation run for each simulation with an identical profile.
  - Setting a value of zero causes the system to generate the random number seed.
    - This means that multiple runs of an identical profile may result in different simulated behavior because random decisions are made differently from run to run.
- When to use zero:
  - Use zero when trying to understand how a process behaves under normal conditions.
  - Each time it runs there are slight statistical variations which is very realistic.
  - Use zero to understand the effect of variations on the performance of a process.

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Figure 2-17. Random number seed (1)

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose** — Look at when to use the random number seed for running a simulation in Modeler.

**Details** —

**Additional information** —

**Transition statement** — Next: Random number seed (2)

## Random number seed (2)

---

- When to use a fixed number:
  - Use fixed numbers when trying to compare two different processes under similar conditions.
  - Use fixed numbers to hold the statistical variation constant while comparing two processes.
- When to use multiple fixed numbers:
  - Use multiple fixed numbers to compare two different processes under varying statistical conditions.

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Figure 2-18. Random number seed (2)

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### **Notes:**



***Instructor notes:***

**Purpose** — Look at when to use the random number seed for running a simulation in Modeler.

**Details** —

**Additional information** —

**Transition statement** — Next: Checkpoint

## Checkpoint

---

1. What is the difference between a simulation profile and a simulation snapshot?  
\_\_\_\_\_
2. What two methods can be used to determine a path in a model?  
\_\_\_\_\_
3. What is the purpose of the random number seed?  
\_\_\_\_\_
4. When would you use a fixed random number seed instead of zero?  
\_\_\_\_\_

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Figure 2-19. Checkpoint

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### **Notes:**

Write your answers here:

- 1.
- 2.
- 3.
- 4.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint solution

## Unit summary

---

Having completed this unit, you should be able to:

- Explain business process analysis
- Describe the purpose of simulation
- Define simulation terminology

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Figure 2-20. Checkpoint solution

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Unit summary

## Checkpoint solution

---

1. What is the difference between a simulation profile and a simulation snapshot?  
A simulation snapshot is a record of the model that will be simulated. A simulation profile is a record of the model plus the simulation attributes.
2. What two methods can be used to determine a path in a model?  
Probabilities and expressions.
3. What is the purpose of the random number seed?  
The random number seed is the starting point for a series of numbers. This setting defines a random number, which determines a fixed starting point for the sequence of random values that are used in a simulation.
4. When would you use a fixed random number seed instead of zero?  
Use fixed numbers when trying to compare two different processes under similar conditions. Use fixed numbers to hold the statistical variation constant while comparing two processes.

---

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Figure 2-21. Unit summary

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### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —**





## Unit 3. Setting up and running simulations

### Estimated time

00:45

### What this unit is about

This unit describes the setting up and running simulations.

### What you should be able to do

After completing this unit, you should be able to:

- Describe element behavior in simulations
- Create a snapshot
- Define simulation attributes
- Define simulation preferences

### How you will check your progress

- Checkpoint
- Lab exercises

### References

None

## Unit objectives

---

After completing this unit, you should be able to:

- Describe element behavior in simulations
- Create a snapshot
- Define simulation attributes
- Define simulation preferences

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Figure 3-1. Unit objectives

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### **Notes:**

***Instructor notes:***

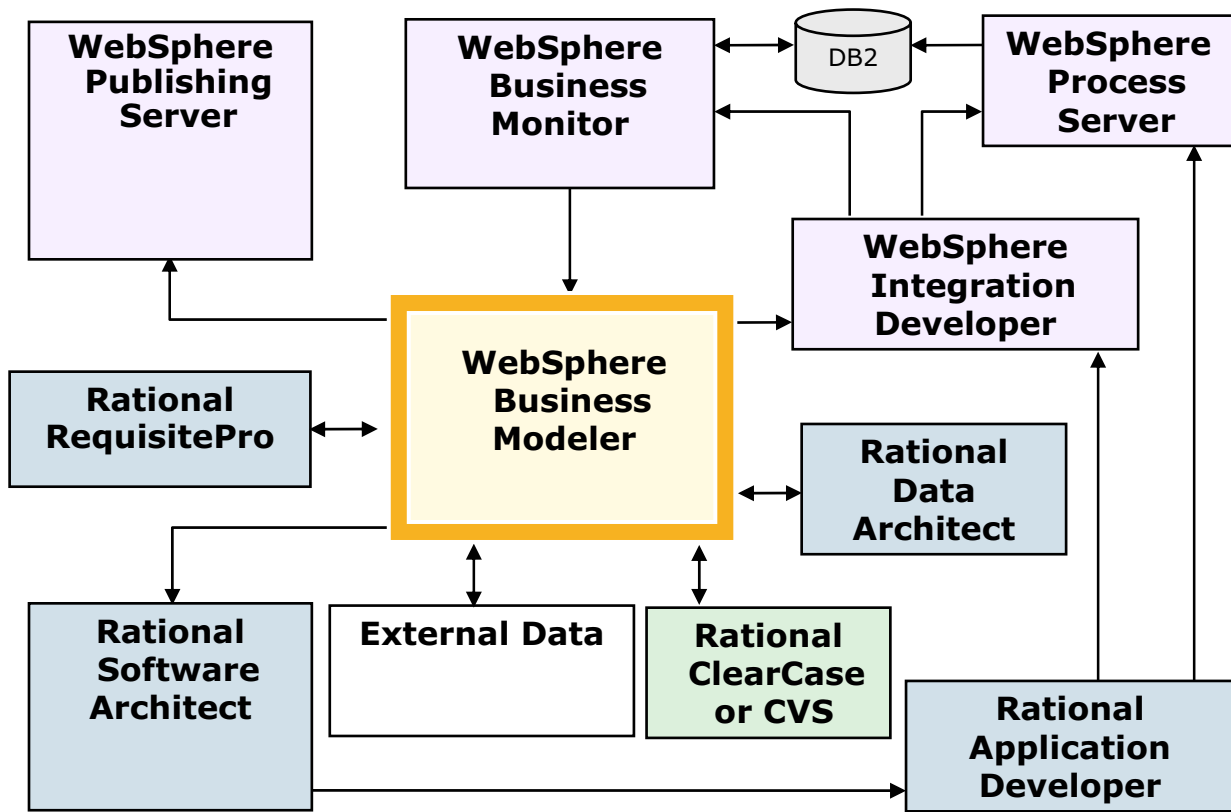
**Purpose** — To introduce the content of this unit.

**Details** —

**Additional information** —

**Transition statement** — Next: Setting up and running simulations

## Setting up and running simulations



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Figure 3-2. Setting up and running simulations

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### Notes:

***Instructor notes:***

**Purpose —**

**Details —** This diagram will be used to position the different units throughout the course.

**Additional information —**

**Transition statement —** Next: Element behavior in simulation

## Element behavior in simulation

---

- Process time and cost
  - Accumulated from the attributes of all the included element attributes
  - Process attributes are used if there are no elements inside
- Service time and cost
  - Attributes determine how it performs work
- Task and map
  - Attributes determine the time and cost of its work
  - Escalations in human tasks are not evaluated
  - Business rules tasks are treated like generic tasks (business rules not evaluated)
- Timer, broadcaster, receiver, repository, timetable
  - Attributes affect the behavior of the process
- Decisions, merges, forks and joins
  - Use attributes to affect the flow of the process through probabilities or expressions

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Figure 3-3. Element behavior in simulation

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### **Notes:**

***Instructor notes:***

**Purpose** — Look at the element behavior in simulation

**Details** —

**Additional information** —

**Transition statement** — Next: Role and resource behavior in simulations

## Role and resource behavior in simulations

---

- Roles and resources
  - Determine time and cost based on specified allocations
  - Resource attributes take precedence over role attributes
  - In human task, primary owner is treated as a normal resource or role requirement
- Costs for resources and roles
  - If you define costs for both resources and roles, the resource cost takes priority
    - Role cost is used only if no other cost is associated with the resource
  - For a process containing an activity that has a requirement for a role.
    - The resource cost of the activity is based on the cost of the qualified resource that is allocated to the activity
- Resource and role allocations
  - There is no capability to select specific resources to be allocated for simulations
  - If a process instance ends before an activity role or resource allocation time is complete, the roles or resources are de-allocated from the activity and can be allocated to another activity
  - A role or resource allocation may be split into multiple intervals, if the allocated role or resource is not continuously available for the entire duration of the resource requirement

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Figure 3-4. Role and resource behavior in simulations

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### Notes:

**Resource allocation** – If you want to represent a call center where the manager of the department starts to take calls after all the operators are on the phone, you have to create additional logic in the model to accomplish this. There is no way to tell the simulator to assign all the operators before selecting the manager to perform the Customer Representative role. The system selects them randomly.

For example, if the customer service role has a cost of \$25 an hour but the individual resource that is assigned to the activity, John Doe, has a cost of \$22 an hour, the resource cost will be based on \$22 an hour. If no cost is defined for the allocated resource, the role cost is used to determine the activity resource cost.



***Instructor notes:***

**Purpose —**

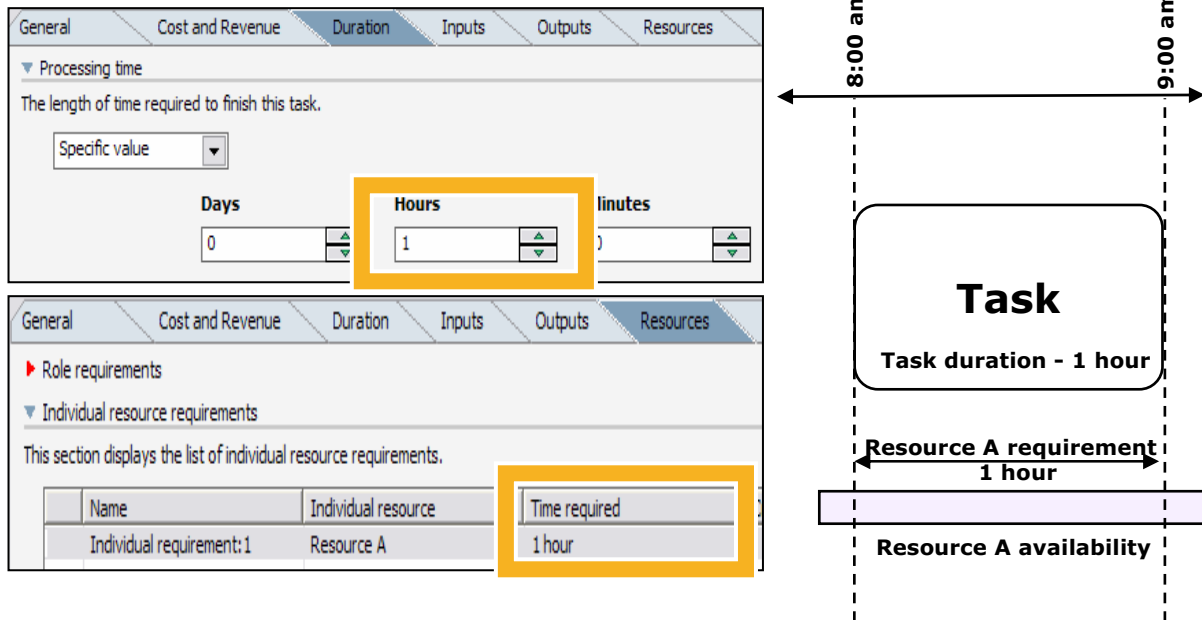
**Details —**

**Additional information —**

**Transition statement —** Next: Task duration and resource requirements

## Task duration and resource requirements

- Duration is used to determine cycle time
- Resource time required is used to determine cost
- Often the resource time and duration are equal



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Figure 3-5. Task duration and resource requirements

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### Notes:

***Instructor notes:***

**Purpose** — Task duration and resource requirements have different purposes and functions.

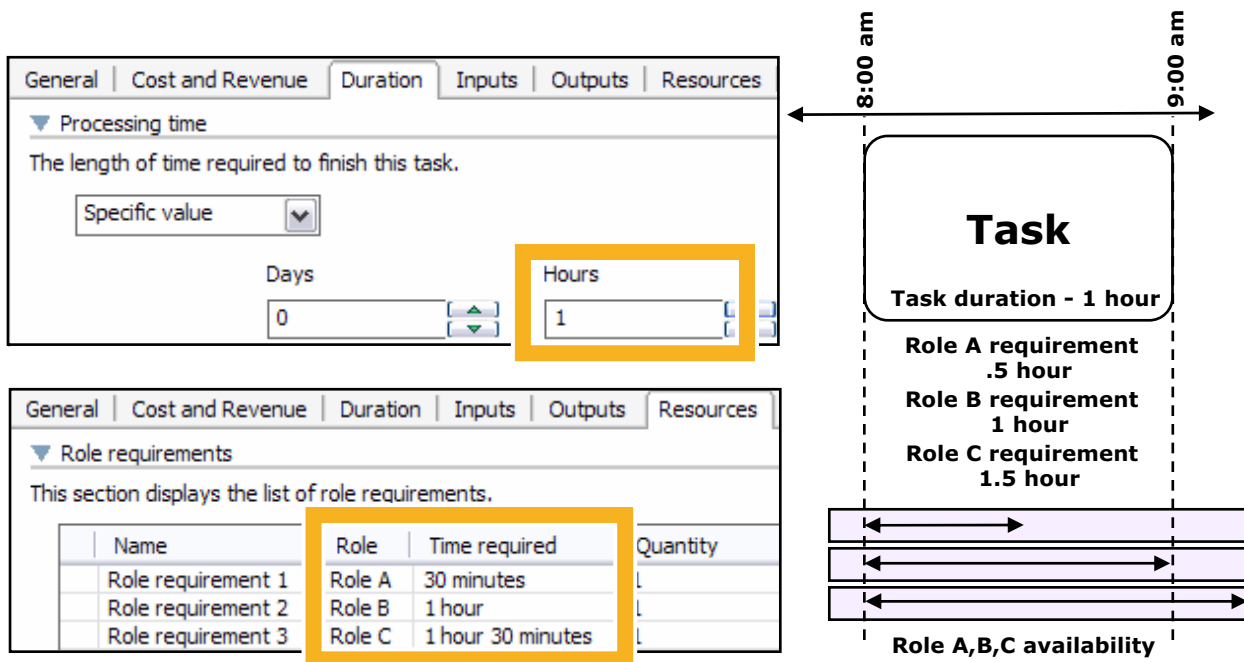
**Details** —

**Additional information** —

**Transition statement** — Explain why both resources and roles are needed.

## Resource time required is independent of duration

- Resource time required can be shorter or longer than duration
- All resources must be available to start the task



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Figure 3-6. Resource time required is independent of duration

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### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Single resource: task time equals resource time

## Single resource: task time equals resource time

- **Use resources' time required as a task processing time**
  - Set to “Yes”
  - Wait for resource end time to complete a task

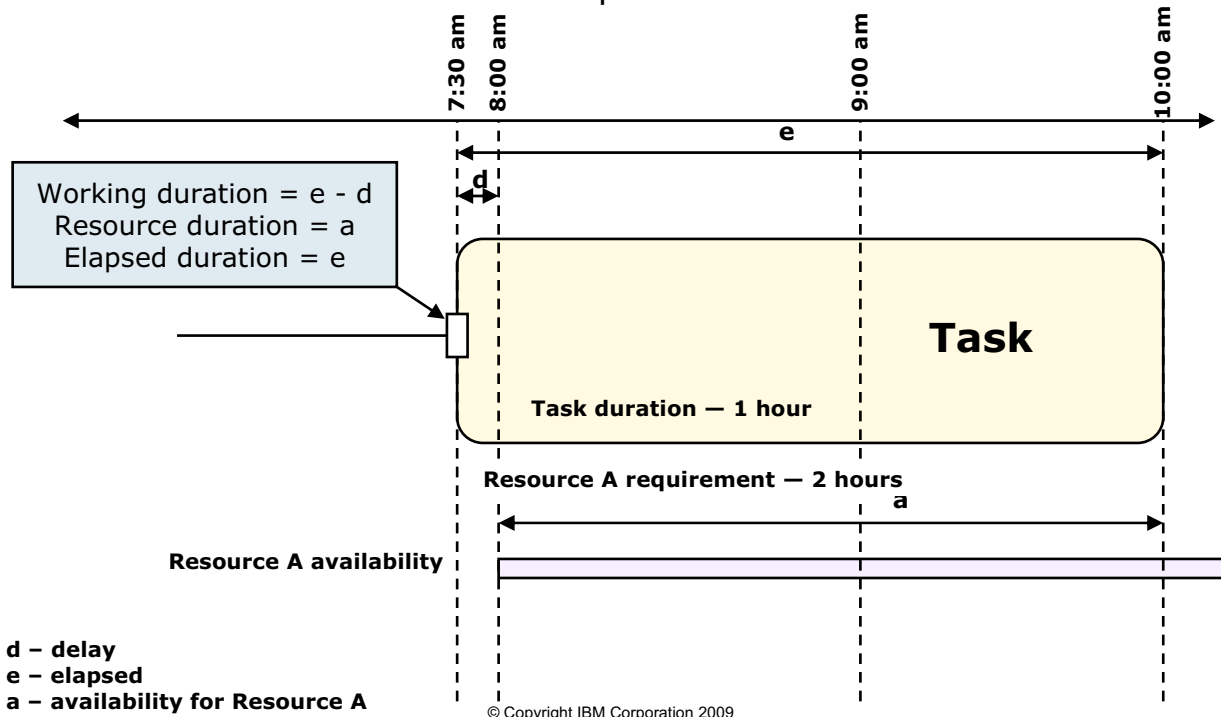


Figure 3-7. Single resource: task time equals resource time

WB286 / VB2861.0

### Notes:

If the Task behavior with simulation preference set to “Yes,” the task has stretched to two hours for the processing time.

***Instructor notes:***

**Purpose** — This slide illustrates the single resource behavior during simulation.

**Details** —

**Additional information** —

**Transition statement** — Next: Single resource: task time equals set duration

## Single resource: task time equals set duration

- Use resources' time required as a task processing time
  - Set to “No”
  - Use duration for time to complete a task

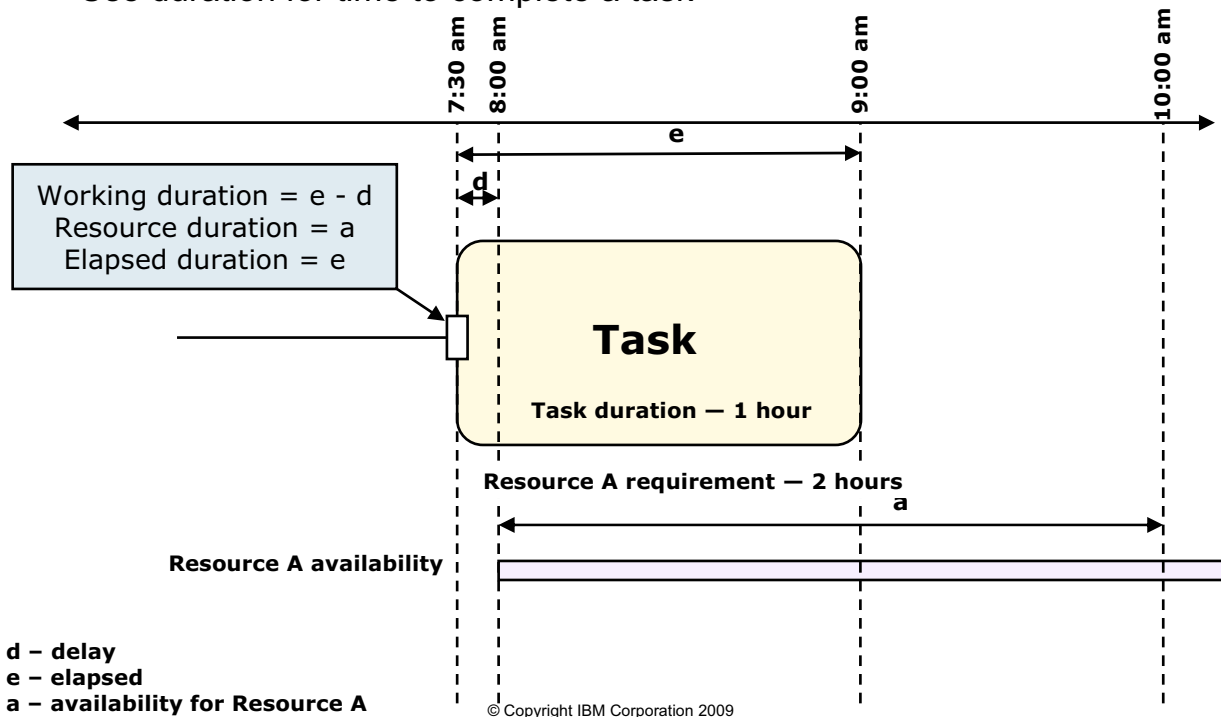


Figure 3-8. Single resource: task time equals set duration

WB286 / VB2861.0

### Notes:

If the Task behavior with simulation preference set to “Yes,” the task is held at one hour with a longer resource required time.



***Instructor notes:***

**Purpose** — This slide illustrates the single resource behavior during simulation.

**Details** —

**Additional information** —

**Transition statement** — Next: Multiple resources

## Multiple resources

- Task behavior with simulation preference set to “Yes”
  - Wait for resource end time to complete a task

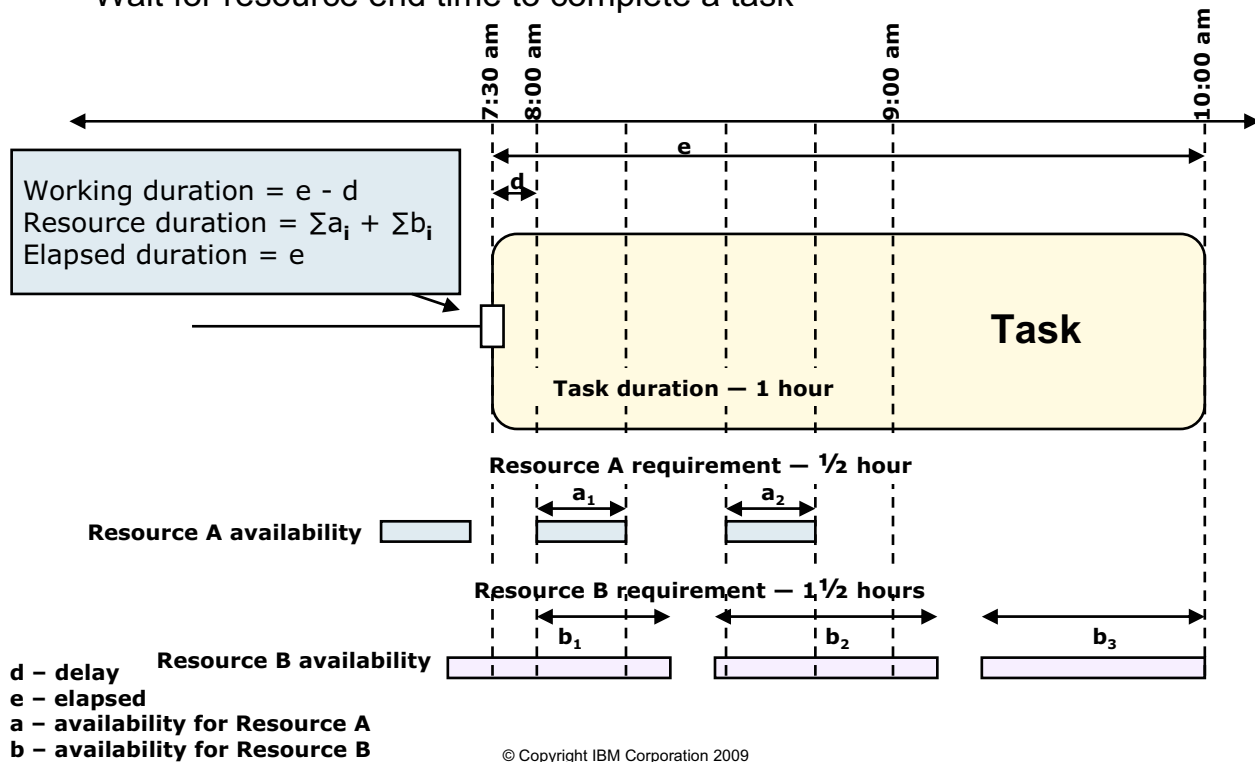


Figure 3-9. Multiple resources

WB286 / VB2861.0

### Notes:

Resource A is available in 15-minute segments, for a total of one hour.

Resource B is available in 40-minute segments, for a total of one hour.

The total resource time is two hours, which is the time it takes to do the task.

Note that the total time to complete the task could be greater than two hours.

***Instructor notes:***

**Purpose** — This slide illustrates the multiple resources' behavior during simulation, and it waits for resources' end time to complete a task.

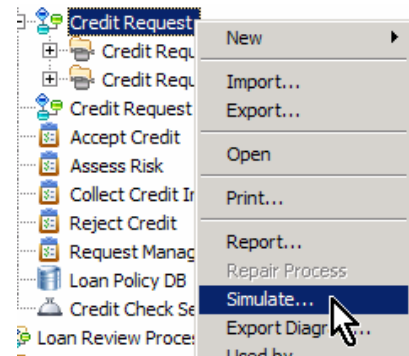
**Details** —

**Additional information** —

**Transition statement** — Next: Creating a simulation snapshot

## Creating a simulation snapshot

- To simulate a process, you must create a simulation snapshot.
  - Creating a simulation snapshot creates an initial simulation profile.
- The snapshot generator asks to check the terminate nodes.
  - Every process must end with a stop node.
- Fix critical errors before creating a snapshot.
- A new simulation snapshot appears in the Project Tree.
  - Its name is made up of:
    - The name of the originating process
    - The words “simulation snapshot”
    - A timestamp
  - The simulation snapshot contains the simulation snapshot settings and an initial simulation profile.



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Figure 3-10. Creating a simulation snapshot

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### Notes:

***Instructor notes:*****Purpose —**

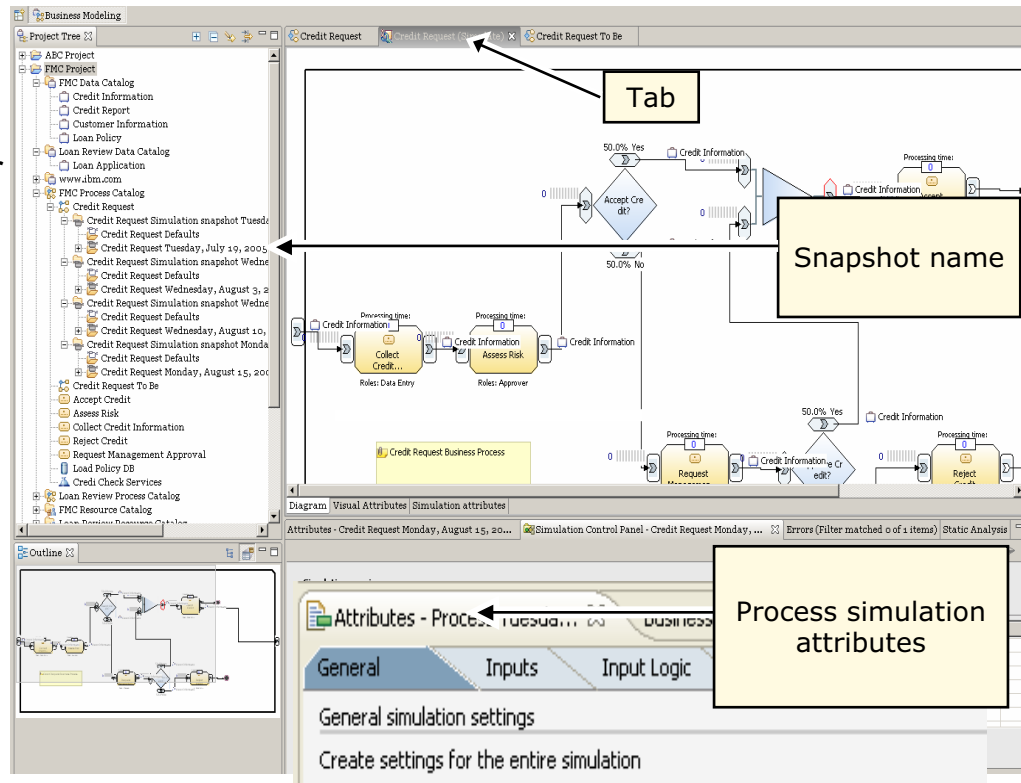
**Details —** A new simulation snapshot appears in the Project Tree view. Its name is made up of the name of the originating process, the words “Simulation Snapshot,” and a timestamp for the time it was created. The simulation snapshot contains the simulation snapshot settings, and an initial simulation profile. The initial values of the simulation snapshot settings and the simulation profile settings are inherited from the simulation preferences.

**Additional information —**

**Transition statement —** Next: Simulation snapshot (1 of 2)

## Simulation snapshot (1 of 2)

- The simulation snapshot opens in the editor area.
- Snapshot name
  - Rename to indicate settings
- Simulation attributes
  - Define the simulation behavior



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Figure 3-11. Simulation snapshot (1 of 2)

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### Notes:

***Instructor notes:***

**Purpose** — The purpose of this slide is to look at the simulation snapshot and settings and understand the simulation diagram.

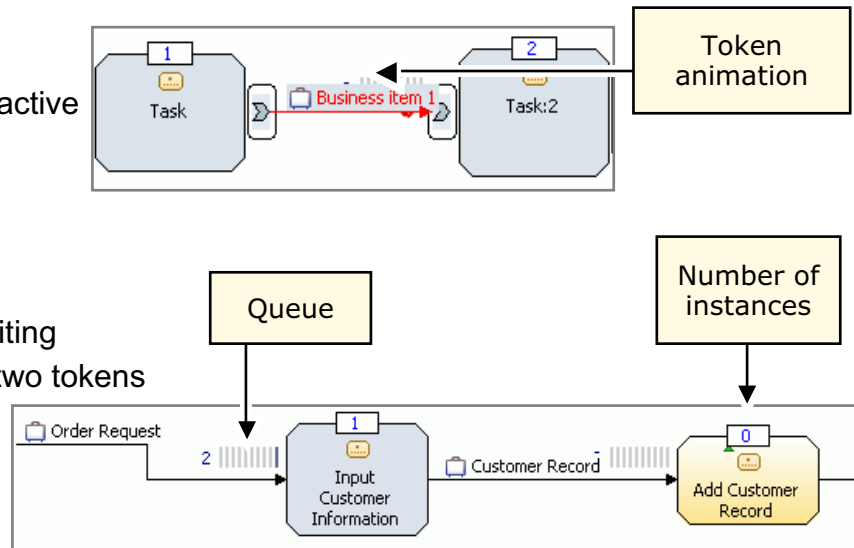
**Details** —

**Additional information** —

**Transition statement** — Next: Simulation snapshot (2 of 2)

## Simulation snapshot (2 of 2)

- Token animation
  - Watch the movement of tokens
  - Look for bottlenecks
- Activity color
  - Changes color when active
- Instances
  - Displays number of instances
- Queue
  - Number of tokens waiting
  - Each bar represents two tokens
- Animation is not necessary
  - Turning off shortens execution time



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Figure 3-12. Simulation snapshot (2 of 2)

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### Notes:



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Simulation attributes: General (1 of 2)

## Simulation attributes: General (1 of 2)

- Process availability begins and Process availability ends
- Evaluate subprocesses
- Maximum simulation duration
  - Real time in which the simulation occurs
- Maximum number of process invocations
  - Per simulation run

Overview | **General** | Inputs | Input Logic | Business Item Creation | Resource Pool | Interrupts

Create settings for the entire simulation

Process availability begins

Process availability ends

Evaluate all subprocesses ☒ Yes ☐ No

Maximum simulation duration

Days	Hours	Minutes	Seconds	Milliseconds
<input type="text" value="365"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Maximum number of process invocations

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Figure 3-13. Simulation attributes: General (1 of 2)

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### Notes:

#### Specifying simulation snapshot settings for subprocess evaluation

Use this setting to specify whether or not subprocesses will be evaluated when you run simulations. Subprocesses that are not evaluated behave similarly to tasks, with fixed costs and durations.

#### Specifying simulation snapshot settings for the maximum simulation duration

This setting specifies the maximum amount of real-time that simulations will run.

***Instructor notes:***

**Purpose** — The purpose of this slide is to look at the general simulation attributes.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation attributes: General (2 of 2)

## Simulation attributes: General (2 of 2)

- Random number seed
- Delay for steady state simulation
  - Virtual wait time before collecting statistics
  - Skip data collection during startup
- Method of selecting output path
- Use resources' time required as task process time

Random number seed: 0

Delay for steady state simulation

Days: 0, Hours: 0, Minutes: 0, Seconds: 0, Milliseconds: 0

Method of selecting an output path: Based on probabilities to a single path

Use resources' time required as a task processing time: ☒ Yes ☐ No

Dropdown menu options:

- Randomly to a single path
- Randomly to a single path
- Based on probabilities to a single path
- Based on an expression

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Figure 3-14. Simulation attributes: General (2 of 2)

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### Notes:

#### Specifying simulation snapshot settings for the steady state simulation delay

This setting specifies the period that must elapse in the virtual time of a simulation run before statistics gathering commences.

#### Specifying simulation snapshot settings for selecting output paths

This setting determines the selection method that the simulation engine uses to choose between multiple paths when a process activity has more than one set of outputs defined by output criteria.

**Randomly to a single path** For each activity in the process that has multiple output criteria, the simulator randomly selects a single output criterion and generates outgoing tokens for each output defined in the selected output criterion.

**Based on probabilities to a single path** For each activity in the process that has multiple output criteria, the simulator makes a random selection (biased according to the

probabilities associated with each output criterion) of a single output criterion and generates outgoing tokens for each output defined in the selected output criterion.

**Based on an expression** For each activity in the process that has multiple output criteria, the simulator selects the first output criterion which either does not have a test expression or has a test expression which evaluates to true. Test expressions are currently used only by decision nodes. **Note:** Selecting this option enables all expressions throughout the process such as those defined for preconditions, postconditions, and correlations.

### **Specifying simulation snapshot settings for the random number seed**

This setting defines a random number seed, which determines a fixed starting point for the sequence of random values that are used in a simulation.

### **Specifying simulation snapshot settings for using the resource time requirements for task duration**

Use this setting to specify that processing durations for each activity in a process should always be equal to the resource requirement that has the longest duration for the activity.

***Instructor notes:***

**Purpose** — The purpose of this slide is to look at the general simulation attributes.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation attributes: Inputs (1 of 2)

## Simulation attributes: Inputs (1 of 2)

- Associate a token with a business item
  - The business item will arrive with the token
- Number of tokens per bundle
  - Number of tokens that arrive at the same time
- Total number of tokens
  - Number of tokens generated per run
  - Total tokens are grouped by bundle
- One-time cost per token

Overview | General | Inputs | Input Logic | Business Item Creation | Resource Pool | Interrupts

Change the settings for creating tokens associated with inputs.

Name	Associated data	Minimum	Maximum	Input source
Input	Credit Information	1	1	Flow

Remove Token Creation Settings

Number of tokens per bundle

Total number of tokens

One-time cost per token

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Figure 3-15. Simulation attributes: Inputs (1 of 2)

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### Notes:

**Total number of tokens** specify the total number of inputs that will be transmitted from the input. You can specify a specific value or, if you want to use a variable value, you can specify a distribution. If you want to use a distribution, refer to step 4 for details on available distribution types.

**Number of tokens per bundle** specify how many inputs will be bundled and transmitted together from the input. You can specify a specific value or, if you want to use a variable value, you can specify a distribution.

***Instructor notes:***

**Purpose** — The purpose of this slide is to look at the simulation attributes for input.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation attributes: Inputs (2 of 2)



## Simulation attributes: Inputs (2 of 2)

- Time trigger
  - Fixed interval with a start time
- Random time trigger
  - Select a statistical distribution for token generation
- Timetable trigger
  - Use a timetable to generate tokens

☐ Time trigger

Start time

Recurring time interval for bundle creation

☒ Random time trigger

Random time value  
Exponential distribution  Minutes

☐ Timetable trigger

Click Browse and select a timetable

Number of times to repeat  Repetition period  Beginning on

Recurring time intervals Exemption period

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Figure 3-16. Simulation attributes: Inputs (2 of 2)

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### Notes:

***Instructor notes:***

**Purpose** — The purpose of this slide is to look at the simulation attributes for input.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation attributes: Input logic

## Simulation attributes: Input logic

- Input criteria simulation settings:
  - For one process input: The probability of the input is 100%.
  - For multiple process inputs: Specify the probability of receiving each of the different inputs or combination of inputs.

General Inputs **Input Logic** Business Item Creation Resource Pool Interrupts

Input criteria simulation settings

The values found in this section define the probability that an input will take a particular path.

Name	Criterion	Probability (%)
Input Criterion	Input	100

General Inputs **Input Logic** Business Item Creation Resource Pool Interrupts

Input criteria simulation settings

The values found in this section define the probability that an input will take a particular path.

Name	Criterion	Probability (%)
Input Criterion	Input	50
OR Input Criterion:2	Input:2	50

Detail

**Output Criteria Associations**

Input set name: Input Criterion

Name	Probability (%)
Output Criterion	100

Output criteria associations  
Specify the association between the inputs of the process and the outputs of the process

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Figure 3-17. Simulation attributes: Input logic

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### Notes:

***Instructor notes:***

**Purpose** — The purpose of this slide is to look at the simulation attributes for input logic.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation attributes: Business item creation

## Simulation attributes: Business item creation

- Business item creation
  - Specifies the business items to be created by the process
- Create simulation values
  - Specifies the rule used to create business items

Business item creation

Define how values are set on business items leaving this data input.

Name	Associated data	Minimum	Maximum	Output target
Input	Business item 1	1	1	Flow

Create Simulation Values

**Simulation value creation**

Select a rule type for business item creation in simulation.

**Value creation rule**

- No Rule
- No Rule
- Random List
- Weighted List
- Define custom rules

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Figure 3-18. Simulation attributes: Business item creation

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### Notes:

***Instructor notes:***

**Purpose** — For an activity within a process, you can specify rules that govern how values are assigned to business items that will be used in the simulation.

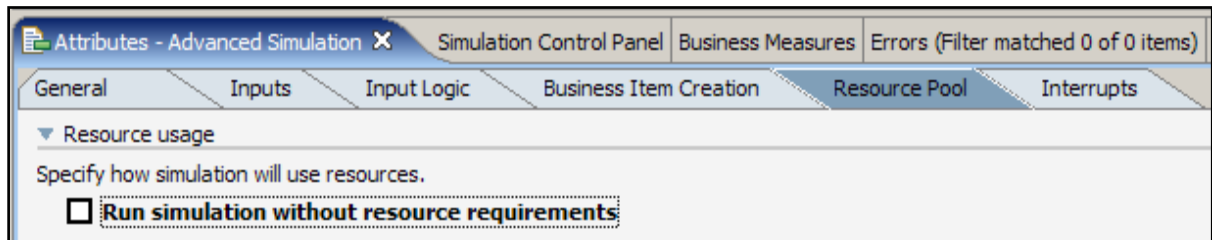
**Details** —

**Additional information** —

**Transition statement** — Next: Simulation attributes: Resource pool (1 of 2)

## Simulation attributes: Resource pool (1 of 2)

- Resource usage
  - Run simulation without resource requirements.
    - Ignore the resource requirements.
    - Use to test the model without resources.



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Figure 3-19. Simulation attributes: Resource pool (1 of 2)

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### Notes:

#### Specifying simulation snapshot settings for resource usage

Use this setting to cause simulations to ignore resource requirements altogether during a simulation.

***Instructor notes:***

**Purpose** — The purpose of this slide is to look at the simulation attributes for resource usage and resource pool.

**Details** —

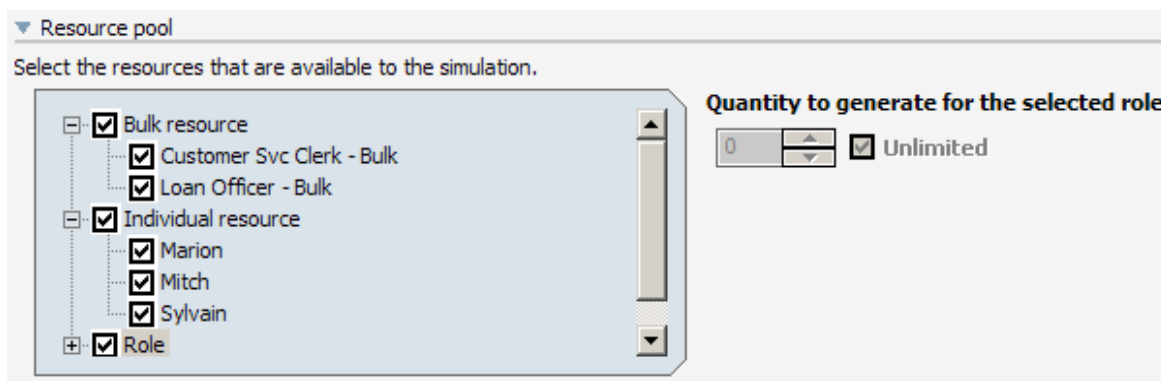
**Additional information** —

**Transition statement** — Next: Simulation attributes: Resource pool (2 of 2)



## Simulation attributes: Resource pool (2 of 2)

- Resource pool
  - Select resources to be made available to the simulation.
    - By default, all resources defined in your project are available.
    - If the roles are checked, the simulation will supply as many roles as needed.
    - The number of roles can be limited.



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Figure 3-20. Simulation attributes: Resource pool (2 of 2)

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### Notes:

By specifying different resource allocations to a process that you simulate, you can determine the consequences of operating with fewer or more resources available. If you run multiple simulations with different levels of resource allocation, you can do a comparative analysis of the simulation results that reveals the effects of changing the resource allocations. You can also choose to ignore resource requirements altogether during a simulation.

**Resource pool** displays the resources for the process.

Select the resources that you want to make available to the process simulation. By default, all resources defined in your project are available. Optionally, specify a quantity of qualified resources to generate for each role required by the process. This enables you to examine the effects of adjusting the availability of qualified resources without actually creating individual resources that are qualified for the role.

***Instructor notes:***

**Purpose** — The purpose of this slide is to look at the simulation attributes for resource usage and resource pool.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation attributes: Interrupts

## Simulation attributes: Interrupts

- Interrupts allow the monitoring of specific conditions.
  - Cost overruns, excessive times spent waiting for resources.
    - The simulation run is automatically suspended when a condition occurs.

General Inputs Input Logic Business Item Creation Resource Pool **Interrupts**

Simulation interrupt settings

Define the conditions that pause the simulation.

**Available interrupt types**

☐ Queue overflow

☐ Total idle time

☐ Total processing time

☐ Total cost

☐ Total deficit

**Available settings for selected interrupt type**

Interrupt setting	Value
Number of interrupt activations to ignore	
Check interrupt ratios	
Threshold (%)	

Interrupt type	Condition
<b>Queue overflow</b>	Total number of activities scheduled for completion at any given moment
<b>Total idle time</b>	Total time spent waiting for resources by all activities in the process
<b>Total processing time</b>	Total processing time of all activities in the process
<b>Total cost</b>	Total cost of performing all activities within a process
	<b>Note:</b> This does not consider revenue generated by activities
<b>Total deficit</b>	Total cost minus revenue of all activities performed within a process

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Figure 3-21. Simulation attributes: Interrupts

WB286 / VB2861.0

### Notes:

## ***Instructor notes:***

### **Purpose —**

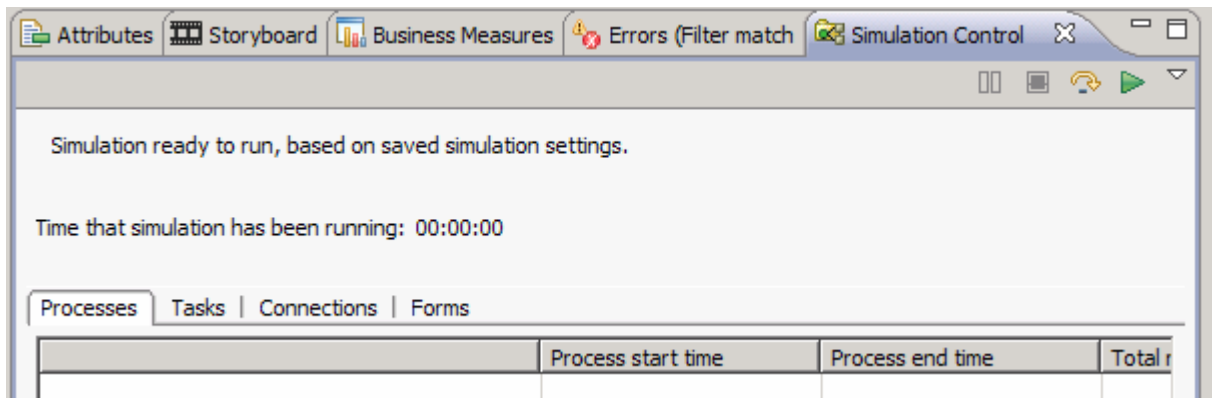
**Details —** Interrupts allow you to monitor certain conditions, such as cost overruns or excessive time spent waiting for resources, by causing a simulation run to be automatically suspended whenever such a condition occurs. You can specify interrupts that apply to the process as a whole or just to one or more activities within the process. You can also specify multiple interrupts (a maximum of one for each available interrupt type) for the process and each of its activities. An example of an interrupt that applies to the process as a whole is the total cost interrupt. When you set an interrupt of this type, you instruct the tool to monitor the total accumulated cost of performing all activities in the process and to suspend the process simulation if the cost goes above the value that you specify.

### **Additional information —**

**Transition statement —** Next: Simulation control panel

## Simulation control panel

- The simulation control panel
  - Controls simulation settings and allows you to pause, stop, step, run a simulation
  - Shows time the simulation has been running
  - Shows data updated as model is running



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Figure 3-22. Simulation control panel

WB286 / VB2861.0

### Notes:

## ***Instructor notes:***

### **Purpose —**

**Details —** You can run a simulation of a process to get an animated view of the process operation and to generate a set of statistical results of the process.

### **Additional information —**

**Transition statement —** Next: Simulation settings

## Simulation settings

- Simulation settings
  - Step settings
  - Animation settings
    - Display animation
    - Speed
  - Statistic settings
    - Specify what is displayed in statistics
  - Replication settings
  - Result settings

**Simulation Settings**

**Step settings**  
Number of tasks per step: 1

**Animation settings**  
☒ Display animation during simulation  
Speed: Slow ————— Fast

**Statistic settings**  
☒ Display statistics during simulation  
☒ Collect statistics for each process instance  
☒ Show process statistics  
☒ Show task statistics  
☒ Show connection statistics  
Maximum process instances to display: 50  
☒ Collect and average statistics across process instances

**Replication settings**  
☐ Replicate simulations consecutively  
Consecutive replications per simulation: 5

**Result settings**  
☒ Store simulation result

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Figure 3-23. Simulation settings

WB286 / VB2861.0

### Notes:

## ***Instructor notes:***

### **Purpose —**

**Details —** Modeler provides a variety of controls that you can use to determine how a simulation will run. You can use these controls to change the pace of running a simulation and to pause the simulation at critical points so that you can change simulation attributes or examine statistical information generated by the process.

### **Additional information —**

**Transition statement —** Next: Simulation statistics



## Simulation statistics

- Displayed in a tab over the attributes
  - Processes, tasks and connections
  - Check box — collect and display statistics across process instances

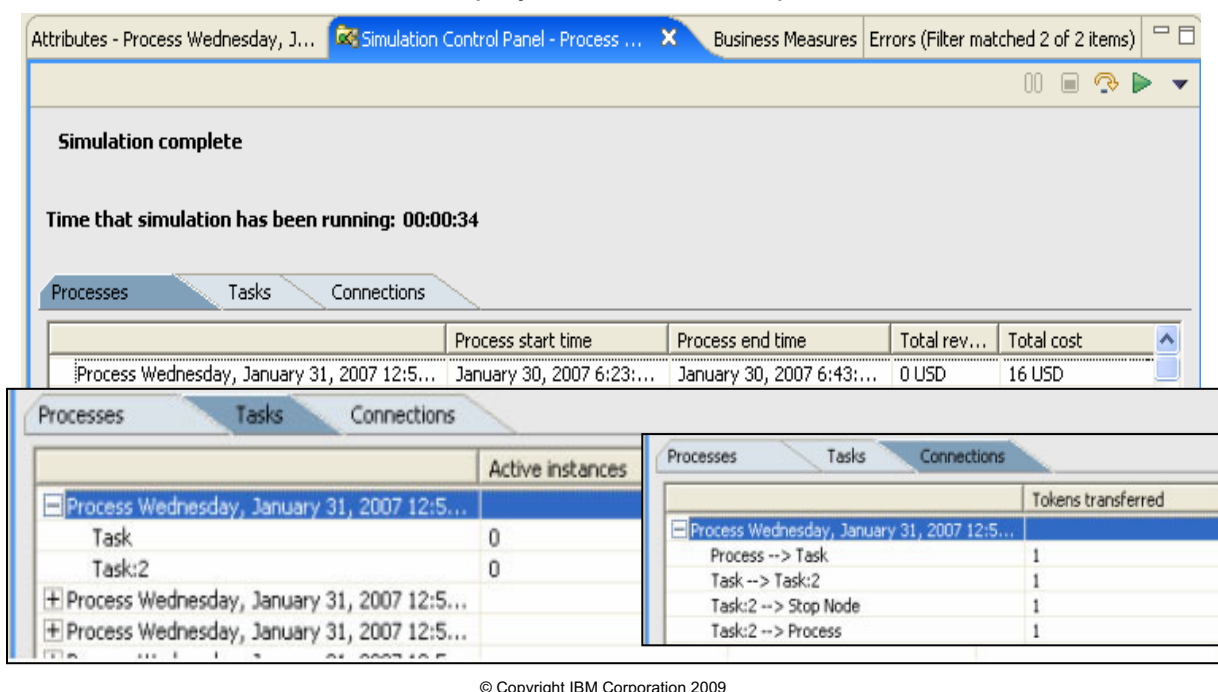


Figure 3-24. Simulation statistics

WB286 / VB2861.0

### Notes:

Under **Statistic settings**, select **Display statistics during simulation** if you want to see the statistics generated by the process as the tool simulates it. Otherwise, the simulation runs and produces simulation results that you can use for dynamic analysis, but does not show simulation statistics in the control panel. If you select this option, you can also specify which elements to display in the statistics in the following manner:

- Select **Collect statistics for each process instance** if you want to see statistics for each generated process instance. If you select this option, you can also enable or disable statistics gathering for processes, tasks, and connections by selecting or clearing the following check boxes:
  - **Show process statistics**
  - **Show task statistics**
  - **Show connection statistics**
- Select a value for **Maximum process instances to display**.

- Select **Collect and average statistics across process instances** if you want to enable viewing generated statistics as averages for all process instances. **Note:** If you want to display generated statistics as averages, you must enable this option and also select **Collect and display statistics across process instances** on the control panel.

***Instructor notes:***

**Purpose —**

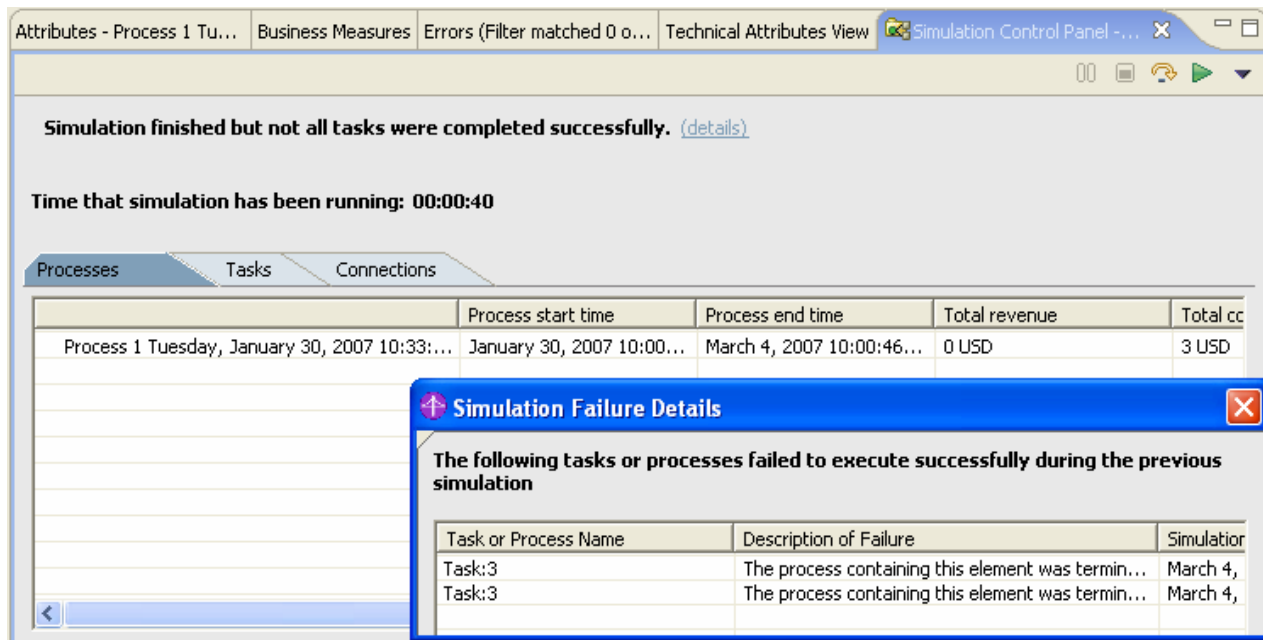
**Details —**

**Additional information —**

**Transition statement —** Next: Simulation errors

## Simulation errors

- Simulation finished but not all tasks were completed successfully (includes details).



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Figure 3-25. Simulation errors

WB286 / VB2861.0

### Notes:

You receive a message saying that there are not enough resources available to complete the simulation.

If a simulation stops and you receive a message saying that there were not enough resources available to complete the simulation, the message is referring to the modeled resource within the simulation, not to a problem with the computer system. You need more resources available for the process. The following are situations that can cause this error:

- A task requires two field technicians but only one is available for the process.
- A task requires a field technician on Monday, and can wait for two days until Wednesday, but the field technician is not available until Friday.
- Roles are assigned to tasks, but there are not enough resources available to fulfill the role requirements.

***Instructor notes:***

**Purpose** — Look at the simulation errors.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation results

## Simulation results

Results are posted in the Project Tree and accessed through dynamic analysis

Simulation complete

Process Instances Summary | Simulation result Wednesday, January 31, 2007 1:00:46 PM EST | Process Wednesday, January 31, 2007 12:59:19 PM

Case Name	Distribution	Success Status	Process Instance Name	Cost	Start Time	Finish Time	Elapsed Duration	Working Duration	Resource
+ Case 1	100.00%	Succeeded		U...			20 minutes	20 minutes	
All Cases	100.00%			U...			20 minutes	20 minutes	

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Figure 3-26. Simulation results

WB286 / VB2861.0

### Notes:

***Instructor notes:***

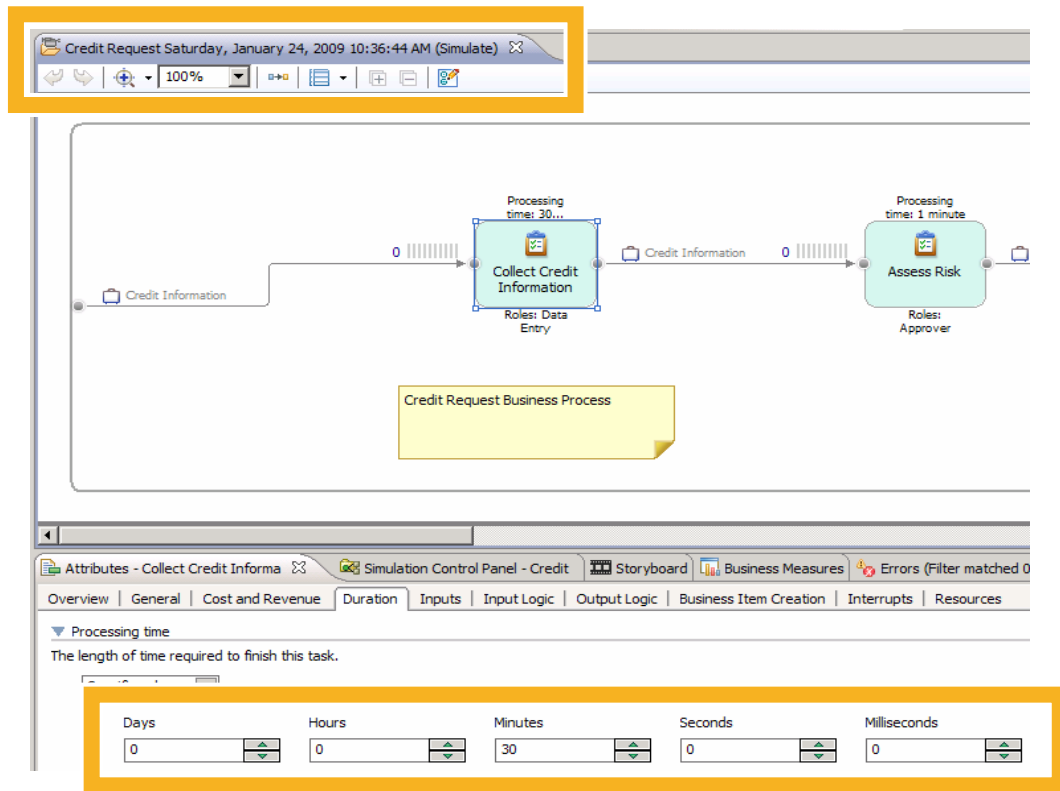
**Purpose** — The purpose of this slide is to look at the dynamic analysis using the simulation results.

**Details** —

**Additional information** —

**Transition statement** — Next: Changing model attributes in the simulation model

## Changing model attributes in the simulation model



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Figure 3-27. Changing model attributes in the simulation model

WB286 / VB2861.0

### Notes:



***Instructor notes:***

**Purpose** — You can change the model attributes in the simulation model to conduct “what-if” analysis.

**Details** —

**Additional information** —

**Transition statement** — Next: Setting simulation preferences

## Setting simulation preferences

---

- Simulation attributes control the behavior of your simulation runs so that simulation snapshots and results reflect real-world behavior.
- Simulation attributes can be set at multiple levels.
  - At the highest level are the simulation preferences.
  - At the next level are the simulation snapshot settings.
  - At the lowest level are those in a particular simulation profile.

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Figure 3-28. Setting simulation preferences

WB286 / VB2861.0

### **Notes:**

Simulation attributes can be set at multiple levels.

- At the highest level are the simulation preferences.
  - Set through the preferences window
  - Used as default values for new simulation snapshots and profiles
- At the next level are the simulation snapshot settings.
  - Subset of the attributes available in the preferences
  - Initial values are taken from the preferences
  - Override these values by editing the “snapshot defaults”
- At the lowest level are those in a particular simulation profile.
  - Initial values are taken from a combination of the simulation preferences and simulation snapshot settings.
  - Override the values in the simulation attribute tabs.

- The settings in the simulation profile are used for simulation and analysis.

***Instructor notes:***

**Purpose** — Look at different levels when setting the simulation preferences.

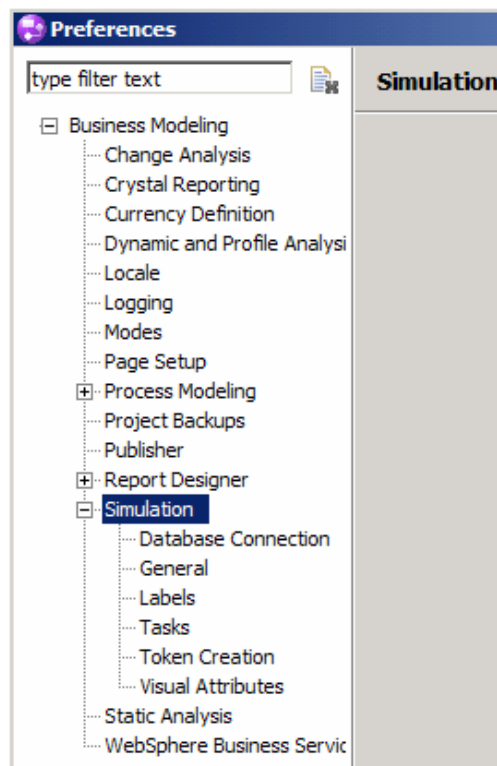
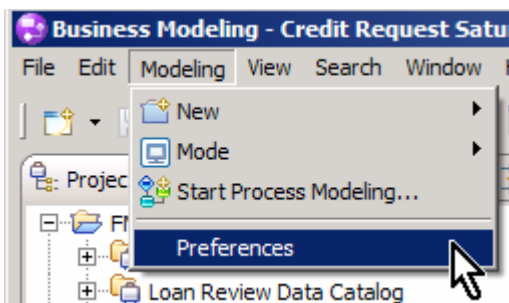
**Details** —

**Additional information** —

**Transition statement** — Next: Simulation preferences

## Simulation preferences

- At the highest level are the simulation preferences.
  - From the tool bar:



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Figure 3-29. Simulation preferences

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### Notes:

***Instructor notes:***

**Purpose** — The purpose of this slide is to look at the highest level.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation preferences: database connection, general, labels

## Simulation preferences: database connection, general, labels

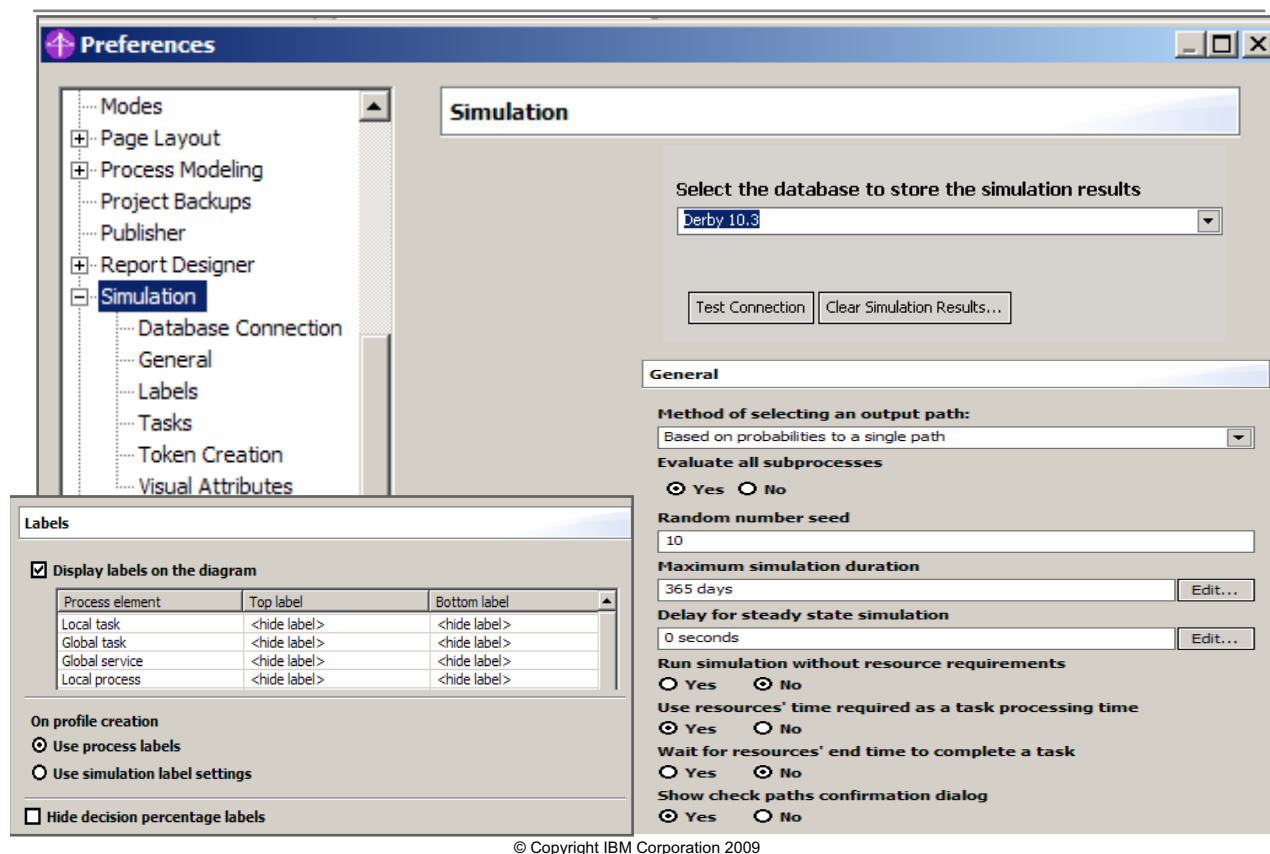


Figure 3-30. Simulation preferences: database connection, general, labels

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

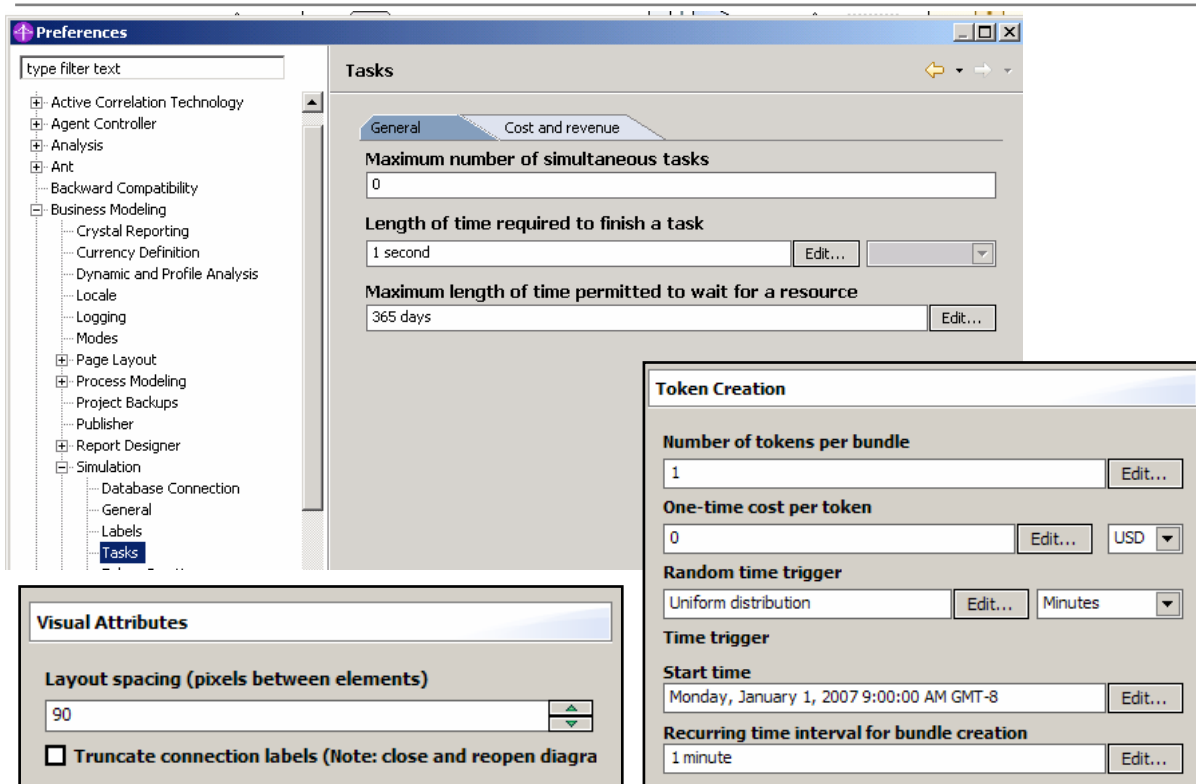
**Details —**

**Additional information —**

**Transition statement —** Next: Simulation preferences: tasks, token creation, visual attributes



## Simulation preferences: tasks, token creation, visual attributes



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Figure 3-31. Simulation preferences: tasks, token creation, visual attributes

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### Notes:

***Instructor notes:***

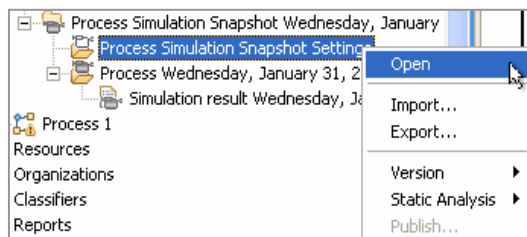
**Purpose —**

**Details —**

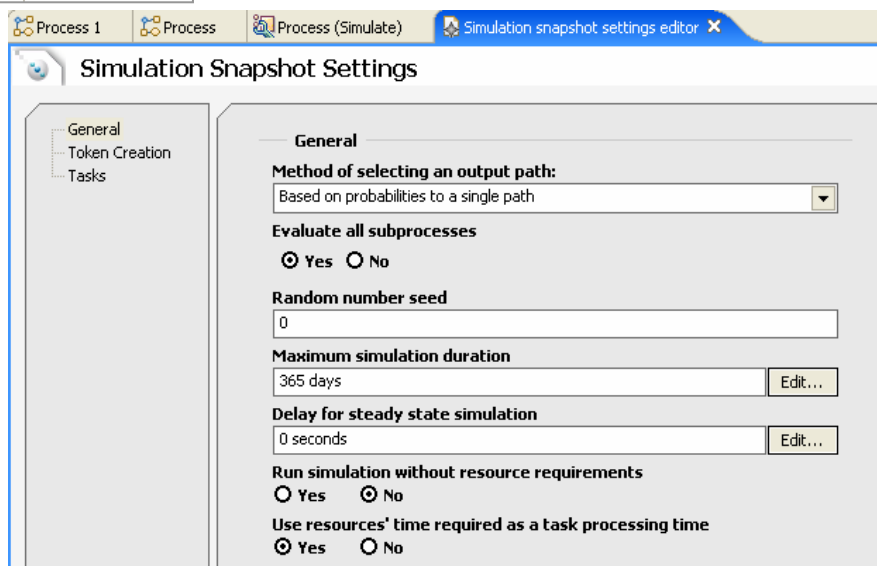
**Additional information —**

**Transition statement —** Next: Simulation snapshot settings (1 of 2)

## Simulation snapshot settings (1 of 2)



- Next level from the Project Tree
- Includes general settings, token creation settings, and tasks settings



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Figure 3-32. Simulation snapshot settings (1 of 2)

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### Notes:

***Instructor notes:***

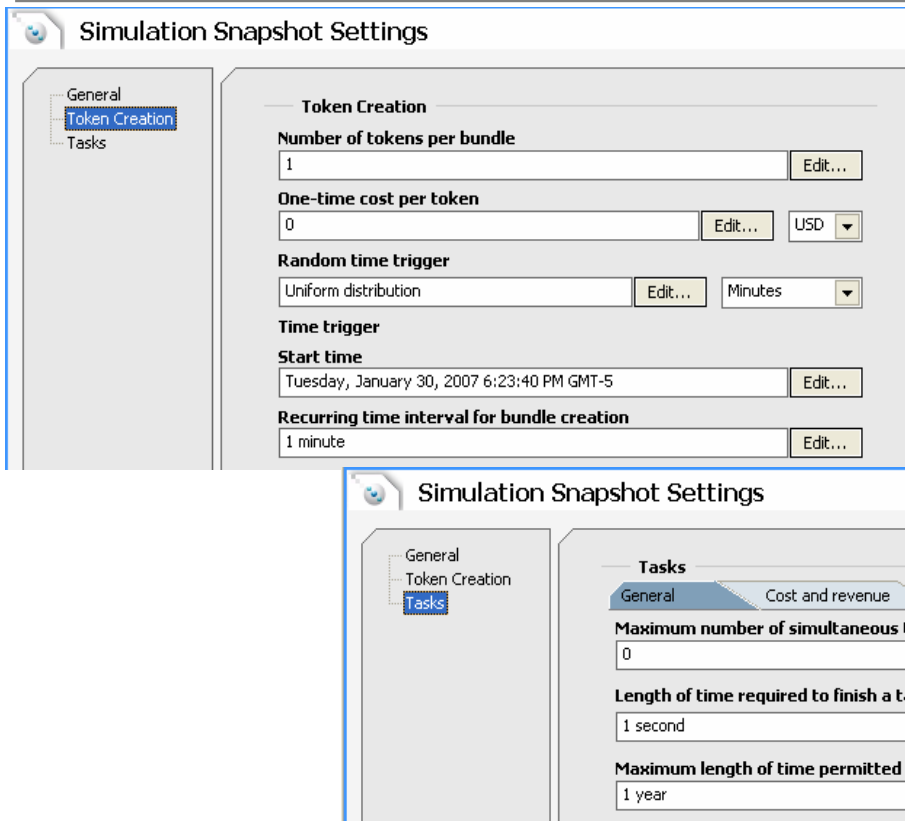
**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Simulation snapshot settings (2 of 2)

## Simulation snapshot settings (2 of 2)



**Simulation Snapshot Settings**

**Token Creation**

Number of tokens per bundle: 1 [Edit...]

One-time cost per token: 0 [Edit...] USD

Random time trigger: Uniform distribution [Edit...] Minutes

Time trigger

Start time: Tuesday, January 30, 2007 6:23:40 PM GMT-5 [Edit...]

Recurring time interval for bundle creation: 1 minute [Edit...]

**Simulation Snapshot Settings**

**Tasks**

General | Cost and revenue

Maximum number of simultaneous tasks: 0

Length of time required to finish a task: 1 second [Edit...] [Unit dropdown]

Maximum length of time permitted to wait for a resource: 1 year [Edit...]

- Token creation and tasks settings

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Figure 3-33. Simulation snapshot settings (2 of 2)

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### Notes:

***Instructor notes:***

**Purpose —**

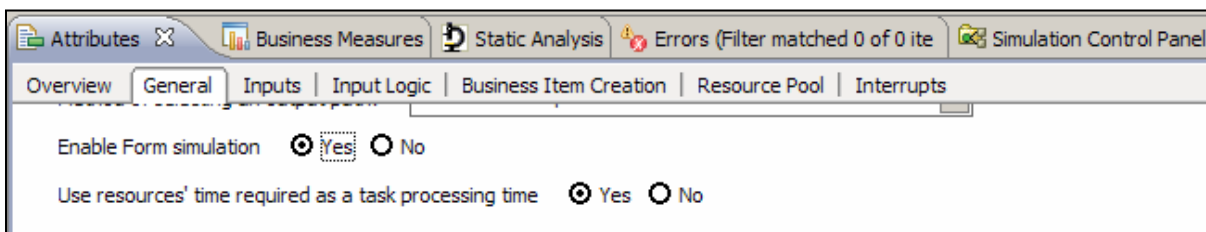
**Details —**

**Additional information —**

**Transition statement —** Next: Simulating human tasks with forms

## Simulating human tasks with forms

- Allow user to interactively simulate business processes and perform more realistic data driven simulations
- Simulate the completion of human tasks that involve forms interactions
- During the simulation run, user are prompted to complete any forms required by the human tasks in the process
- User input data will be used to populate the business items passed on to subsequent tasks and decisions in the process flow
- The data entered will influence the execution path of the process
- The process must have at least one human task that has a form associated with it.
- **Enable Form simulation** must be selected.
- The simulation must be data-driven and the **Method for selecting an output path** preference must be set to **Based on an expression**.



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Figure 3-34. Simulating human tasks with forms

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### Notes:

In order to enable forms interaction during simulation, the following criteria must be met:

You must have Lotus Forms Viewer Version 3.0.1 installed.

Lotus Forms Viewer is launched with an Eclipse-embedded browser using Internet Explorer on Windows. The browsers recommended for use with Lotus Forms Viewer are as follows:

- Microsoft Internet Explorer 6.0 Service pack 1, on the Microsoft Windows 2000 Service pack 4
- Microsoft Internet Explorer 6.0 or Microsoft Internet Explorer 7 for Microsoft Windows XP Service pack 2
- Microsoft Internet Explorer 7 on Windows Vista

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint



## Checkpoint

---

1. What is the difference between task duration and resource time requirements?  
\_\_\_\_\_
2. What is the function of a resource pool during simulation?  
\_\_\_\_\_
3. When is the purpose of an interrupt?  
\_\_\_\_\_
4. How do you turn off the animation during a simulation so that it runs more quickly?  
\_\_\_\_\_

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Figure 3-35. Checkpoint

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### **Notes:**

Write your answers here:

- 1.
- 2.
- 3.
- 4.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Unit summary

## Unit summary

---

Having completed this unit, you should be able to:

- Describe element behavior in simulations
- Create a snapshot
- Define simulation attributes
- Define simulation preferences

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Figure 3-36. Unit summary

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint solution

## Checkpoint solution

---

1. What is the difference between task duration and resource time requirements?  
Task duration is used to determine cycle time.  
Resource time requirements are used to calculate cost
2. What is the function of a resource pool during simulation?  
The resource pool allows the selected resources to be made available to the simulation
3. When is the purpose of an interrupt?  
Interrupts allow the monitoring of specific conditions such as cost overruns or excessive time spent waiting for resources.  
The simulation run is automatically suspended when a condition occurs
4. How do you turn off the animation during a simulation so that it runs more quickly?  
In Simulation Settings, clear the “Display Animation during simulation” check box

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Figure 3-37. Checkpoint solution

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

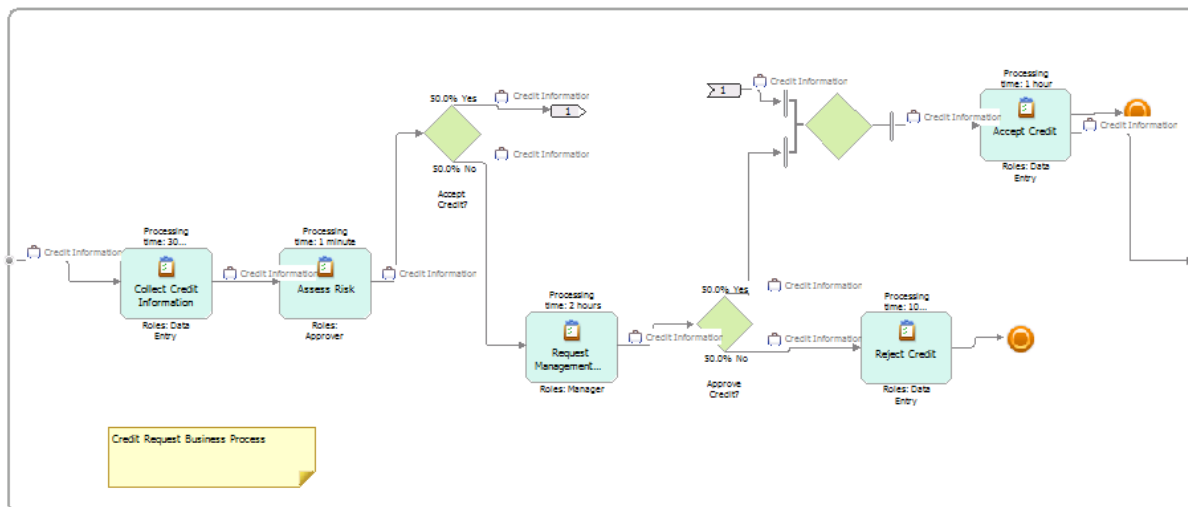
**Additional information —**

**Transition statement —** Next: Exercise overview

## Exercise overview

In this exercise, you will:

- Run a process simulation
- Use global simulation settings
- Run a simulation with global simulation attributes
- Use local simulation attributes
- Run a simulation with local simulation attributes



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Figure 3-38. Exercise overview

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### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —**



## Unit 4. Profile and dynamic analysis

### Estimated time

00:45

### What this unit is about

This unit describes the profile and dynamic analysis.

### What you should be able to do

After completing this unit, you should be able to:

- Conduct profile analysis using profile specification and case summary
- Conduct dynamic analysis from simulation results

### How you will check your progress

- Checkpoint
- Lab exercises

### References

None

## Unit objectives

---

After completing this unit, you should be able to:

- Conduct profile analysis using profile specification and case summary
- Conduct dynamic analysis from simulation results

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Figure 4-1. Unit objectives

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### **Notes:**

***Instructor notes:***

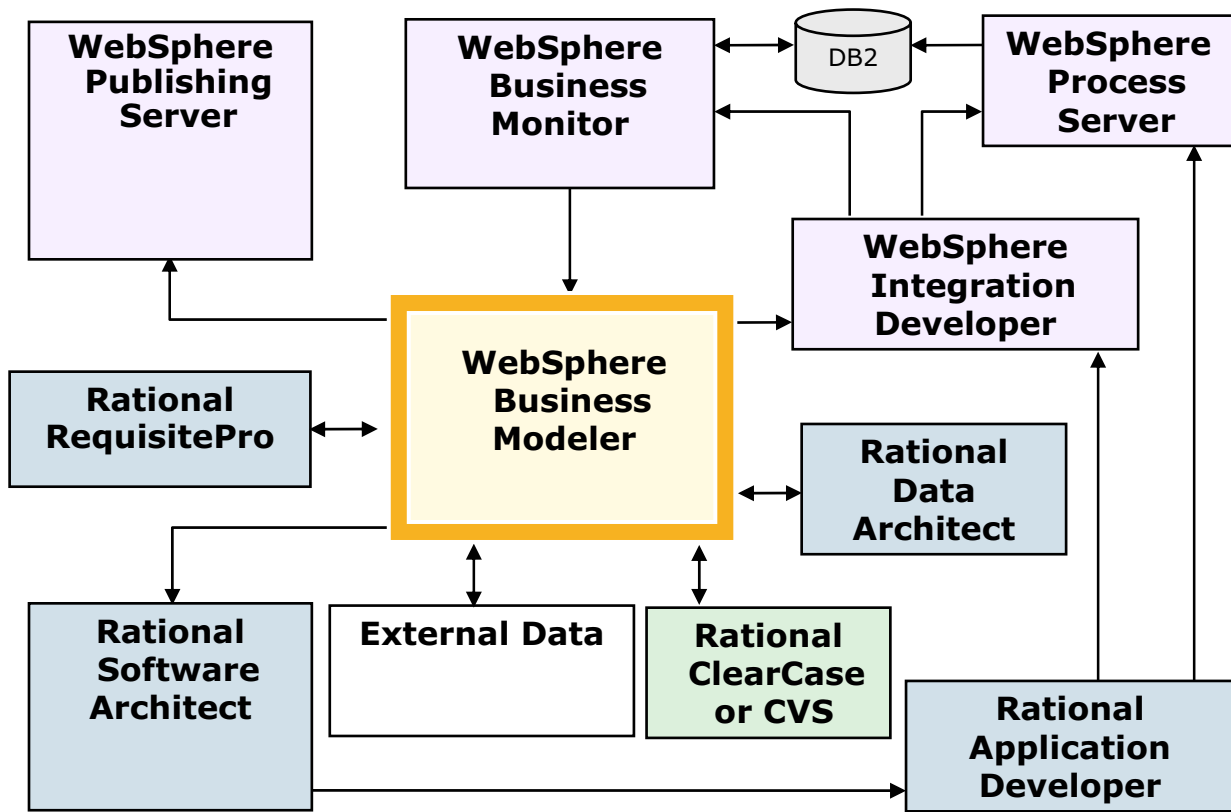
**Purpose** — To introduce the content of this unit.

**Details** —

**Additional information** —

**Transition statement** — Next: Analyzing simulation data in Modeler

## Analyzing simulation data in Modeler



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Figure 4-2. Analyzing simulation data in Modeler

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### Notes:

***Instructor notes:***

**Purpose —**

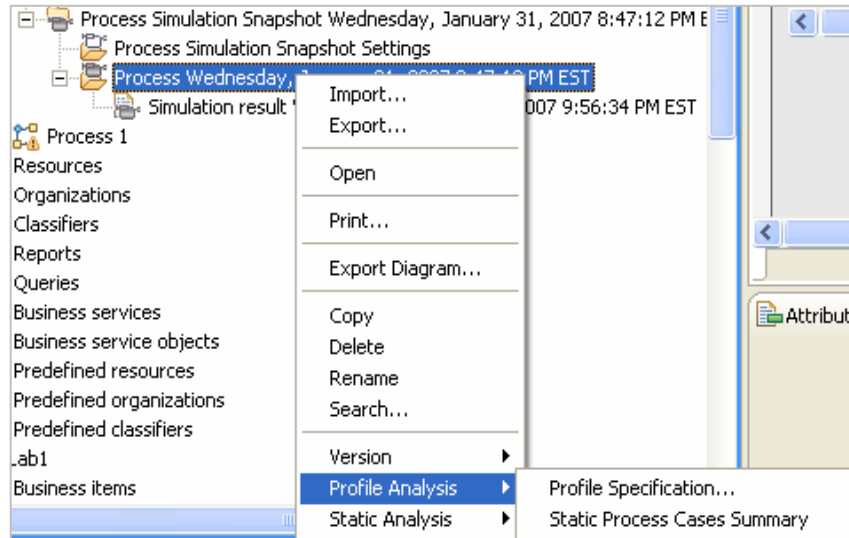
**Details —** This diagram will be used to position the different units throughout the course.

**Additional information —**

**Transition statement —** Next: Analyzing process simulation profiles

## Analyzing process simulation profiles

- Profile analysis is performed on process simulation profiles before simulations are run.
  - A simulation profile must be created before conducting the analysis.
  - Profile specification.
    - Shows the simulation settings for each of the activities in a simulation profile
  - Static process cases summary:
    - Shows summary information describing each of the process cases (paths) through the process recorded by the simulation profile



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Figure 4-3. Analyzing process simulation profiles

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### Notes:

***Instructor notes:***

**Purpose** — Static process cases summary analysis.

**Details** — The static process cases summary analysis describes each of the process cases (paths) through the process recorded by the simulation profile. It includes information about the costs and revenue generated by each possible path and expected relative frequencies of each path being followed.

**Additional information** —

**Transition statement** — Next: Profile specification

## Profile specification

- Specification provides a way of reviewing, documenting, and validating values that are used during a simulation run.
- This analysis reports seven different types of activities:
  - Decisions, loops, tasks, global tasks, services, subprocesses, and global processes
- Analysis attributes can be customized by activity type.

Profile Specification   Process Friday, February 2, 2007 1:22:17 PM EST   1:22 PM						
Activity Name	Activity Duration	Requirement Type	Resource or Role ...	Requirement Duration		
<input type="checkbox"/> Decision				Quantity	Quantity Unit	Classifier
				Classifier Value	Input Name	Associated Input Data
<input type="checkbox"/> Task				Output Name	Associated Output Data	Input/Output Criterion Name
						Distribution
						Processing Cost
<input type="checkbox"/> Task:2						Wait-time Cost
						Wait-time Cost Time Unit
						Revenue
<input type="checkbox"/> Task:3				Output	Business item 1	USD0.00
						1 second
						USD0.00

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Figure 4-4. Profile specification

WB286 / VB2861.0

### Notes:



***Instructor notes:***

**Purpose** — Simulation profile specification analysis.

**Details** — The simulation profile specification analysis displays the simulation settings for each of the activities in a simulation profile.

**Additional information** —

**Transition statement** — Next: Static process cases summary

## Static process cases summary

- A static case summary shows each of the process cases (paths).
- The model cannot contain the following elements, which keep Modeler from determining a finite set of process cases:
  - Repositories, notification broadcasters, notification receivers, observers, and timers
    - The presence of these elements causes an error during analysis.
- Provides a comprehensive description of the possible paths
  - Including the costs and revenue generated by each possible path
  - Includes the expected relative frequencies of each path
- Results for this analysis use several assumptions and limitations

Static Process Cases Summary   Process Friday, February 2, 2007 1:22:17 PM EST   2:26 PM										
Case Name	Activity Name	Cost	Revenue	Run Cost	Resource Cost	Profit	Elapsed Duration	Working Duration	Resource Duration	Distribution
[-] Case 1		U...	USD0.00	USD16...	USD0.00	(U...	20 minutes	20 minutes	0 seconds	50.00%
	Decision	U...	USD0.00	USD0.00	USD0.00	US...	0 seconds	0 seconds	0 seconds	
	Task	U...	USD0.00	USD5.00	USD0.00	(U...	6 minutes	6 minutes	0 seconds	
	Task:2	U...	USD0.00	USD11...	USD0.00	(U...	14 minutes	14 minutes	0 seconds	
[-] Case 2		U...	USD0.00	USD5.00	USD0.00	(U...	6 minutes 1 se...	6 minutes 1 se...	0 seconds	50.00%
	Decision	U...	USD0.00	USD0.00	USD0.00	US...	0 seconds	0 seconds	0 seconds	
	Task	U...	USD0.00	USD5.00	USD0.00	(U...	6 minutes	6 minutes	0 seconds	
	Task:3	U...	USD0.00	USD0.00	USD0.00	US...	1 second	1 second	0 seconds	
All Cases		U...	USD0.00	USD10...	USD0.00	(U...	13 minutes 0....	13 minutes 0.5...	0 seconds	

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Figure 4-5. Static process cases summary

WB286 / VB2861.0

### Notes:

***Instructor notes:*****Purpose —**

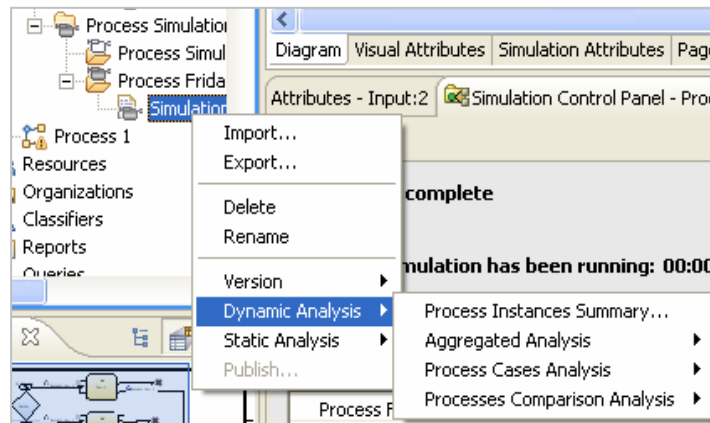
**Details —** Use this analysis when you want an overview of the process cases generated in a simulation. This analysis provides high-level summary information for each process case, including duration and cost information, and indicates whether the process case reached a successful completion or not. It lists the activities that make up each case and, when possible, quantifies their average cost and average elapsed duration. By selecting a process case in the Analysis view, you can highlight the paths of that process case in the Simulation view.

**Additional information —**

**Transition statement —** Next: Dynamic analysis

## Dynamic analysis

- Dynamic analysis shows the results of a process simulation from different perspectives:
  - Time, money, and statistics
- Analysis can be performed at three levels of granularity:
  - Aggregated analysis
    - Uses all the data from the entire simulation
  - Process cases analysis
    - Uses data from specific cases
  - Process instance analysis
    - Uses data from a specific instance of a process case
- Comparative analysis
  - Compares two simulation runs



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Figure 4-6. Dynamic analysis

WB286 / VB2861.0

### Notes:

***Instructor notes:*****Purpose —**

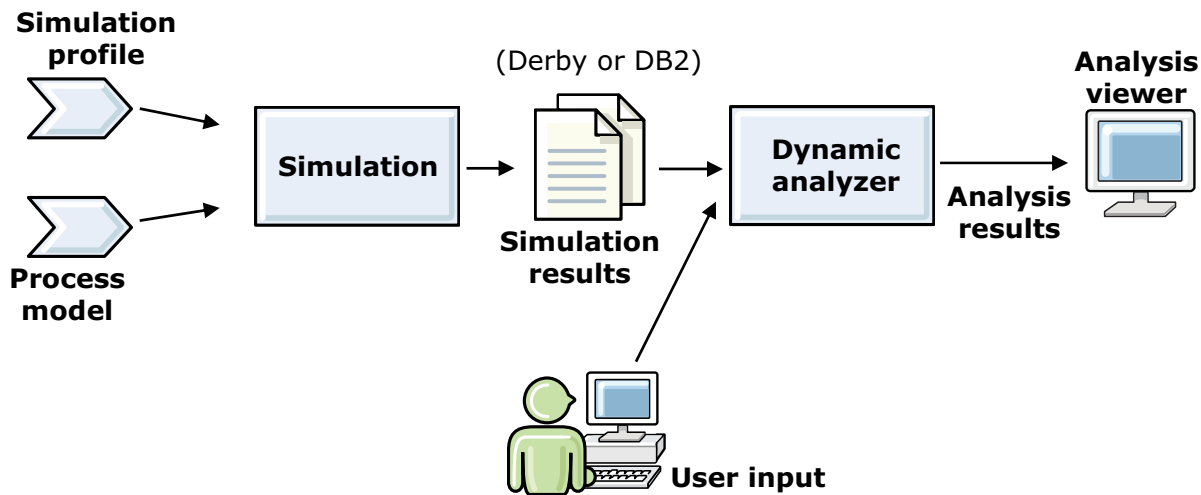
**Details —** Analyze the results of process simulation runs to extract specific information on the monetary results, time results, and statistics generated from the running of a process simulation.

**Additional information —**

**Transition statement —** Next: Analyzing simulation data

## Analyzing simulation data

- A simulation provides a wealth of data, but without detailed analysis, that data is limited in its usefulness.
  - To get the most out of simulation data, dynamic analysis needs to be performed on the results.
  - Extract information regarding scheduling, costs, output, and other statistics pertaining to your processes.



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Figure 4-7. Analyzing simulation data

WB286 / VB2861.0

### Notes:

**Instructor notes:****Purpose —**

**Details —** You can analyze the data from a simulation run at three levels of granularity:

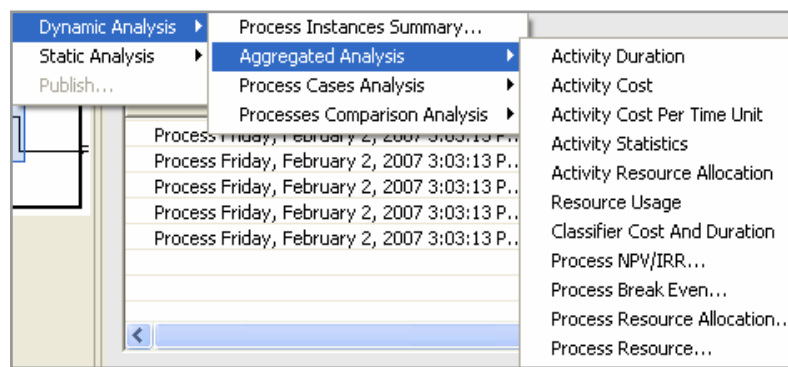
- Aggregated analysis:
  - Aggregated analyses are the most broadly scoped of the dynamic analyses. They use all the data from the entire simulation run for their information. Use these analyses to gain an understanding of the behavior of the process as a whole.
- Process case analysis:
  - Process case analyses use the data from specific process cases to give information. Use these analyses to gain an understanding of a specific case (process flow) within the process.
- Process instance analysis:
  - Process instance analyses are the most granular of the dynamic analyses. They use data from a single instance of a process case for their information. Use these analyses to gain an understanding of the behavior of a specific token's run through the process.

**Additional information —**

**Transition statement —** Next: Aggregated analysis (1)

## Aggregated analysis (1)

- Used to gain an understanding of the behavior of the process as a whole
  - Most broadly scoped of the dynamic analyses
    - Uses all the data from the entire simulation run
- Determines information about activities and resources used in all process instances generated during a simulation



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Figure 4-8. Aggregated analysis (1)

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### Notes:



***Instructor notes:*****Purpose —**

**Details —** Perform aggregated analysis to gain an understanding of the behavior of the simulation run as a whole. Aggregated analyses are the most broadly scoped of the dynamic analyses. They use all the data from the entire simulation run for their information.

**Additional information —**

**Transition statement —** Next: Aggregated analysis (2)

## Aggregated analysis (2)

---

- Analyzing activity durations
  - Shows the average time it takes for each activity to complete
  - Indicates time taken waiting for resources to be available
- Analyzing activity costs
  - Understand the costs incurred by the activities
- Analyzing activity cost per time unit
  - Compute the average rate of cost of each activity
- Analyzing activity statistics
  - Information on the successful completion of the process activities
- Analyzing activity resource allocations
  - Summary of the resources allocated to each activity
  - Resources allocated and the average allocation time, cost, and shortages for each resource

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Figure 4-9. Aggregated analysis (2)

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Aggregated analysis (3)

## Aggregated analysis (3)

---

- Analyzing resource usage
  - Activities that each resource was allocated to
  - Information about time, cost, and shortage durations
  - Detailed information about every allocation of the resource
- Analyzing classifier cost and duration
  - Information regarding the average cost and duration of an entire classification of activities within the process.
- Analyzing net present value and internal rate of return
  - Current net present value of a process
    - Need to provide an initial cost, a discount rate, and a payback period
    - Internal rate of return necessary to produce a net present value of zero by the end of the payback period

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Figure 4-10. Aggregated analysis (3)

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Aggregated analysis (4)

## Aggregated analysis (4)

---

- Analyzing the break-even point
  - Number of times a process must run to generate enough profit to recover a specified fixed cost
    - Value is based on the average costs and revenue for the process as a whole.
- Analyzing process resource allocations
  - How each activity uses its resources to help identify resource shortages
  - How the resources required by an activity contribute to the cost
- Analyzing process resources
  - List of the resources used by the process
  - Average allocations of the resources

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Figure 4-11. Aggregated analysis (4)

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

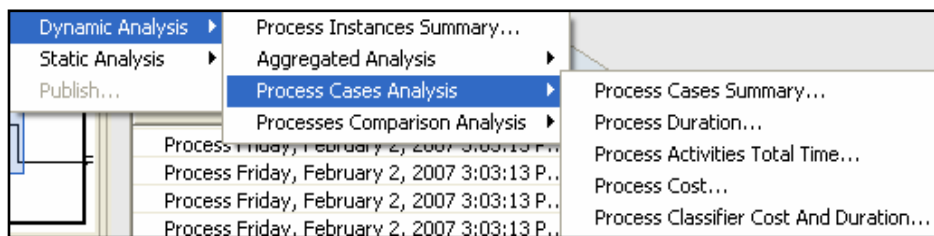
**Details —**

**Additional information —**

**Transition statement —** Next: Process cases analysis (1)

## Process cases analysis (1)

- Used to gain an understanding of a specific case (process flow) within the process
- Shows weighted average values, where the average value is weighted for each process case to account for the distribution of process instances to that case relative to other cases
- Organizes and averages the simulation results generated for each process case, which enables you to investigate variations in performance between different patterns of process flow



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Figure 4-12. Process cases analysis (1)

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### Notes:



**Instructor notes:****Purpose —**

**Details —** You can perform several types of process case analyses to determine the performance of a simulated process across all of its process instances. Process case analysis provides statistical information that takes into account all process cases and their probabilities of occurrence. A process case is a form that a process instance can take, in which units of work follow a particular pattern of connections and activities within a branching process flow. Process case analyses show weighted average values for the results of simulated processes, where the average value is weighted for each process case to account for the distribution of process instances to that case relative to other cases.

**Additional information —**

**Transition statement —** Next: Process cases analysis (2)

## Process cases analysis (2)

---

- Analyzing process cases summaries
  - Display summary information for each of the process cases produced during a simulation
- Analyzing process durations
  - Examine the average durations of all process cases
- Analyzing process activities total times
  - Determine the average total time values for all process instances
- Analyzing process costs
  - Examine the average costs, revenues, and profits for all process instances
- Analyzing classifier costs and durations
  - Show the costs and durations of activities associated with each classifier value used in a process

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Figure 4-13. Process cases analysis (2)

WB286 / VB2861.0

### **Notes:**

**Instructor notes:****Purpose —**

**Details —** You can use process case analysis when you want to examine process-level data that is gathered from all process instances in a simulation, in order to understand how a process performs when it is run a large number of times. Process case analysis organizes and averages the simulation results generated for each process case, which enables you to investigate variations in performance between different patterns of process flow. As a result of these investigations, you may determine that you need to modify a process model to improve the overall results or the results for one or more cases. In addition to results for each case, process case analysis also provides weighted average results that take all cases into account.

**Additional information —**

**Transition statement —** Next: Process instance analysis (1)

## Process instance analysis (1)

- Process instance analysis is used to gain an understanding of the behavior of a specific token's run through the process.
  - Get a detailed understanding of each individual pass through a process during simulation
- Process instance analyses are the most granular of the dynamic analyses.
  - Use data from a single instance of a process case

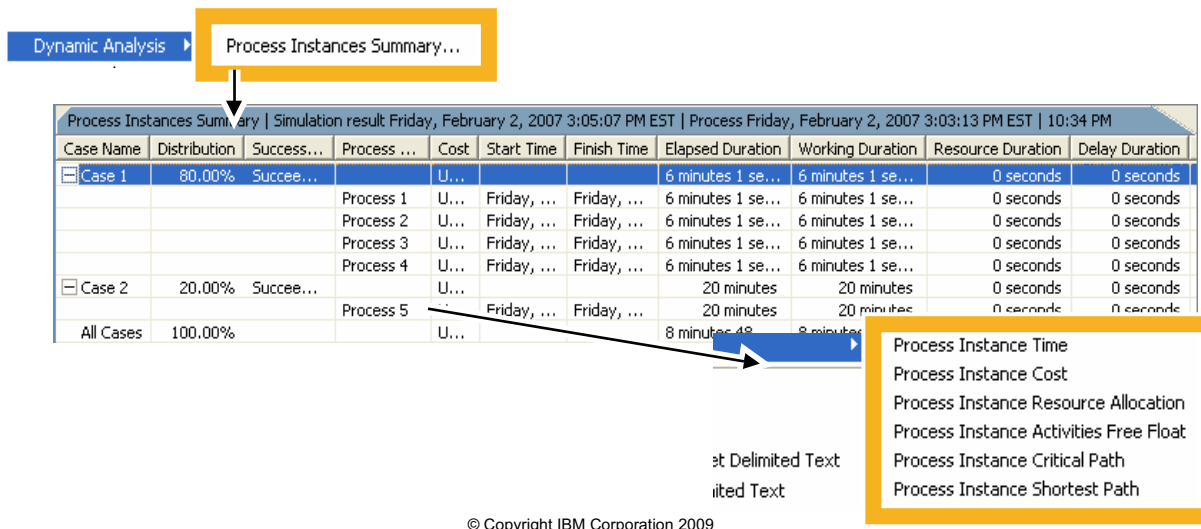


Figure 4-14. Process instance analysis (1)

WB286 / VB2861.0

### Notes:

***Instructor notes:*****Purpose —**

**Details —** Perform process instance analysis to get a detailed understanding of each individual pass through a process during simulation.

**Additional information —**

**Transition statement —** Next: Process instance analysis (2)

## Process instance analysis (2)

---

- Analyzing process instance times
  - Display the durations of each of the activities involved in a process instance
- Analyzing process instance costs
  - Display detailed information about the cost and revenue for each activity within a process instance
- Analyzing process instance resource allocation
  - Obtain detailed information about the resources allocated to activities in a process instance
- Analyzing process instance activities free float
  - Display information about the available free float (slack time) periods associated with activities in a process instance
- Analyzing process instance critical paths
  - Display the path of longest duration within the process instance
- Analyzing process instance shortest paths
  - Display the path in a process instance that has the shortest duration of all parallel paths

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Figure 4-15. Process instance analysis (2)

WB286 / VB2861.0

### **Notes:**

**Instructor notes:****Purpose —**

**Details —** Before you carry out a process instance analysis, you must have a set of simulation results that you want to analyze. The first process instance analysis you must carry out is a process instance summary analysis. You can then access the additional process instance analyses from the results page of the summary.

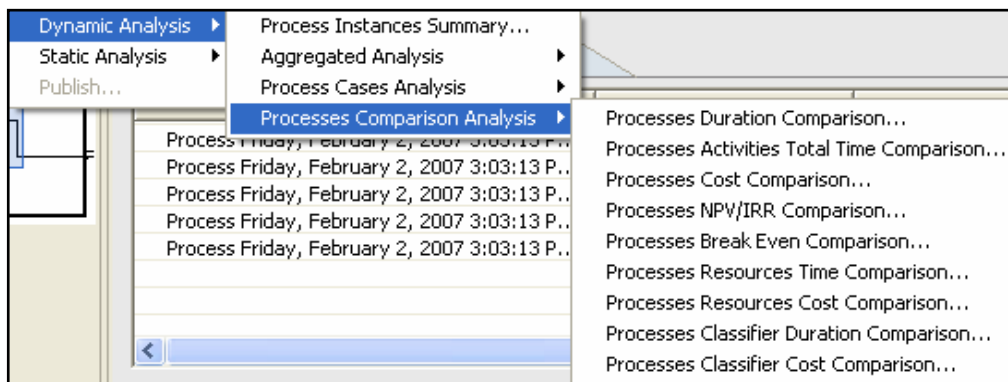
During simulation, every pass through the process creates a process instance, and the data from that pass is recorded for analysis. Use process instance analysis when you want to study the results of a specific process instance. The value of doing this is that it enables you to examine how the process works on a process run level. For example, in simulation of the handling of calls at a call center, you can examine the call with the best or the worst results for elapsed duration or total cost to determine the factors that contributed to those results and to identify potential improvements.

**Additional information —**

**Transition statement —** Next: Processes comparison analysis (1)

## Processes comparison analysis (1)

- Used to highlight differences and similarities in simulation results between two different simulation runs
  - Different versions of a modeled process
  - Different simulation sizes
  - Different decision probabilities
- Compares the weighted average analysis results for two simulated processes that use the same input parameters
  - For example, compare the average length of time it takes to complete your current process versus your proposed future process.



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Figure 4-16. Processes comparison analysis (1)

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### Notes:



***Instructor notes:*****Purpose —****Details —** Perform one of the several comparative analyses to find differences and similarities between the results of two different simulation runs.**Additional information —****Transition statement —** Next: Processes comparison analysis (2)

## Processes comparison analysis (2)

---

- Processes duration comparison analysis
  - Compares the average duration and throughput of two processes
- Processes activities total time comparison analysis
  - Compares the average duration of two processes
- Processes cost comparison analysis
  - Compares the average cost and revenue results
- Processes NPV and IRR comparison analysis
  - Compares process net present value (NPV) and internal rate of return (IRR) analysis results that use the same input parameters
- Processes break-even comparison analysis
  - Compares the break-even analysis results

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Figure 4-17. Processes comparison analysis (2)

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### **Notes:**

***Instructor notes:***

**Purpose** —

**Details** — Before performing this analysis you must have two simulation results that you want to compare.

**Additional information** —

**Transition statement** — Next: Processes comparison analysis (3)

## Processes comparison analysis (3)

---

- Processes resources time comparison analysis
  - Compares the average resource allocation durations based on the same simulation snapshot
  - Can be results from different profiles, or two sets of results from the same profile
- Processes resources cost comparison analysis
  - Compares the average resource allocation costs based on the same simulation snapshot
  - Can be results from different profiles, or two sets of results from the same profile
- Processes classifier duration comparison analysis
  - Compares the average classifier elapsed duration results that use the same input parameters
- Processes classifier cost comparison analysis
  - Compares the average classifier cost results that use the same input parameters

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Figure 4-18. Processes comparison analysis (3)

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### **Notes:**

**Instructor notes:****Purpose —**

**Details —** Use processes comparison analysis to highlight differences in simulation results between versions of a modeled process, simulations of different sizes, or among simulations with different decision probabilities. For example, you can use processes comparison analysis to compare the average length of time it takes to complete your *as-is* process versus your proposed *to-be* processes. When you make changes to a process to optimize cost or throughput performance, you may want to perform several types of comparison analysis to confirm that your intended optimizations are realized, and that there are no unwanted side effects. The average values presented by the comparison analysis are identical to those presented by the process case analysis.

**Additional information —**

**Transition statement —** Next: Dynamic analysis: Preferences

## Dynamic analysis: Preferences

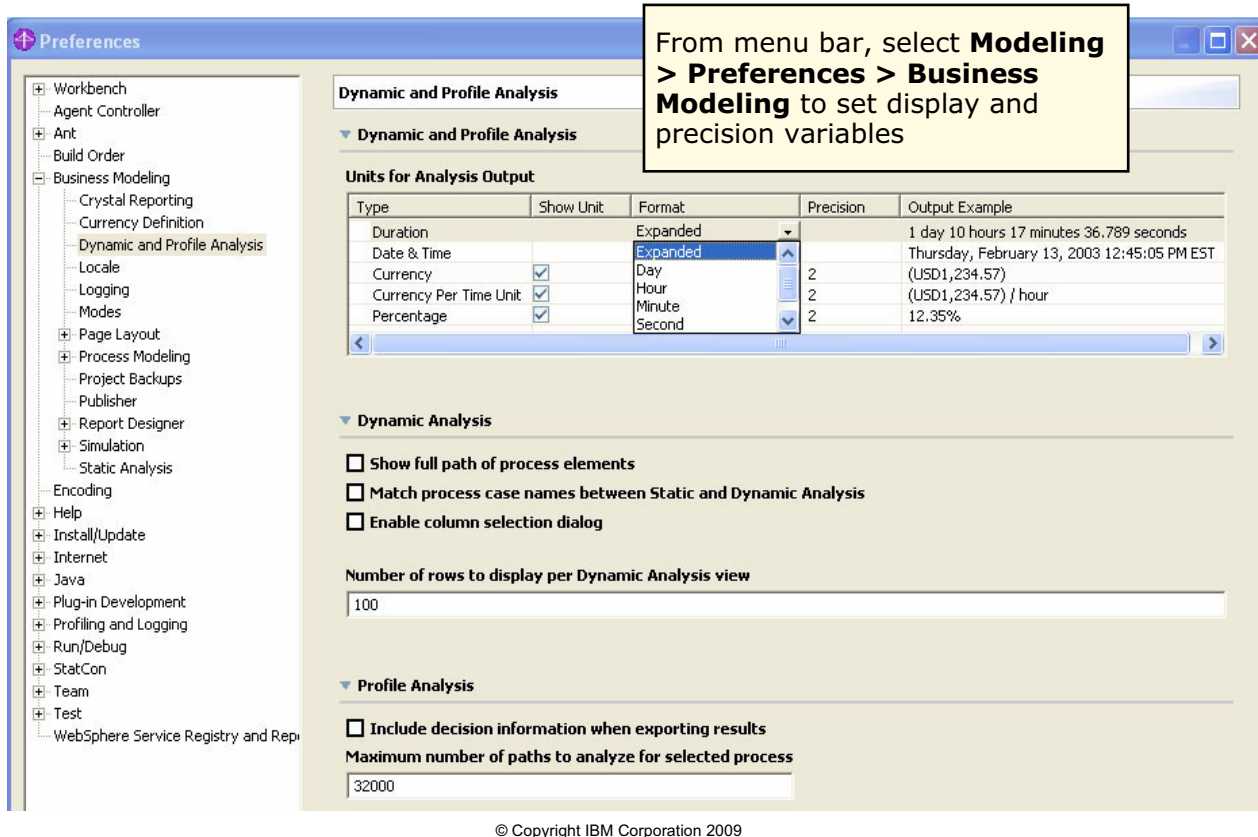


Figure 4-19. Dynamic analysis: Preferences

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### Notes:

The dynamic and profile analysis preferences affect the display and presentation of any analyses you carry out on your simulation profiles or simulation results

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Use of statistical distributions in simulation

## Use of statistical distributions in simulation

---

- Simulation provides an opportunity to understand how a process will behave once implemented.
- Statistical distributions allow a model to reflect more accurately the real world behavior of the business process.
- Distributions help build randomness into a model, something averages cannot do.
- Measured data may be limited, and making decisions with small sample sizes increases the risk of incorrect forecasts or decisions.

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Figure 4-20. Use of statistical distributions in simulation

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### **Notes:**



***Instructor notes:***

**Purpose —**

**Details —** Very rarely do processes run at a set amount of time; they are quite variable most of the time.

**Additional information —**

**Transition statement —** Next: Where are distributions used?

## Where are distributions used?

---

- In Modeler, probability distributions can be assigned to:
  - Token creation
  - Task completion times
  - Task costs
  - Task revenue
- Applying distribution settings to a model in the appropriate places enables greater accuracy in the representation of the process.

The screenshot shows the 'Cost and Revenue' tab in the IBM Modeler software. Under the 'Processing cost' section, there is a 'Distribution' dropdown menu. Below it, the 'Type' is set to 'Normal', with a description 'The well-known bell curve.' and a small graph of a normal distribution curve. To the right of the graph are two input fields: 'Mean' and 'Standard deviation', both of which are set to '0.0'.

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Figure 4-21. Where are distributions used?

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### Notes:

***Instructor notes:*****Purpose —**

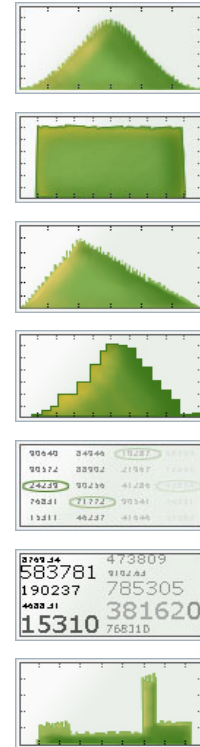
**Details —** You should not start with statistical distributions until you have it running with averages. Start with a base model with average numbers, run a simulation, and see which areas are the most sensitive to change. Then in those areas collect the data and decide which statistical distribution best represents them. Then test again by putting in the distribution and watching for variation. After running the simulation for a long period of time, it should match the averages that you initially put in the model.

**Additional information —**

**Transition statement —** Next: Distributions in WebSphere Business Modeler (1)

## Distributions in WebSphere Business Modeler (1)

- **Normal:** The well-known bell curve
- **Uniform:** Distributes values evenly over a range
- **Triangular:** Useful for approximate modeling when no real-world results are available
- **Poisson:** Useful in characterizing discrete events occurring independently of one another in time
- **Random list:** Provides a list of values, any of which can be selected with equal probability
- **Weighted list:** Provides a weighted probability for each value you define
- **Continuous:** Useful for specifying ranges of values and a probability of each range



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Figure 4-22. Distributions in WebSphere Business Modeler (1)

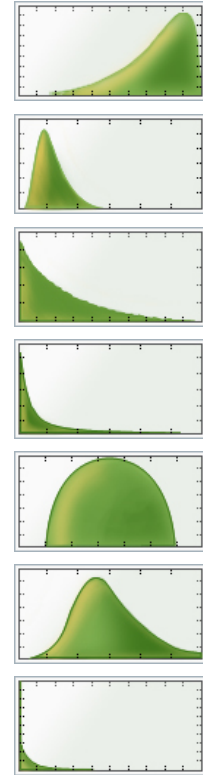
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### Notes:

***Instructor notes:*****Purpose —****Details —** You need to determine the best distribution by collecting some actual data and doing some statistical analysis.**Additional information —****Transition statement —** Next: Distributions in WebSphere Business Modeler (2)

## Distributions in WebSphere Business Modeler (2)

- **Beta**: Useful for Bayesian statistical models, which represent degrees of belief
- **Erlang**: Useful for representing waiting times in queuing systems
- **Exponential**: Useful for characterizing random variables that can take only positive values
- **Gamma**: Useful for continuous random variables constrained to be equal to or greater than 0
- **Johnson**: Best fit distribution
- **Lognormal**: Useful for variables constrained to be greater than 0
- **Weibull**: Useful in modeling reliability, failure rates, and natural phenomena



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Figure 4-23. Distributions in WebSphere Business Modeler (2)

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### Notes:

***Instructor notes:*****Purpose —****Details —** You need to determine the best distribution by collecting some actual data and doing some statistical analysis.**Additional information —****Transition statement —** Next: Distribution parameters

## Distribution parameters

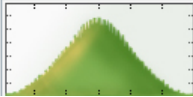
- The settings that you can specify depend on the type of distribution you select, as shown in the following table:

Distribution ▼

Type

Normal

The well-known bell curve.



Mean 0.0 Standard deviation 0.0

Distribution type	Settings
Exponential	Mean
Gamma	Mean, Standard Deviation
Lognormal	Mean, Standard Deviation
Normal	Mean, Standard Deviation
Poisson	Mean
Uniform	Minimum, Maximum

Distribution type	Settings
Weighted list	Probabilities, Values
Random list	List of values
Beta	A,B
Continuous	Values, Probability
Triangular	Minimum, Maximum, Mode
Weibull	Alpha, Beta
Erlang	Exp mean, K

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Figure 4-24. Distribution parameters

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### Notes:



***Instructor notes:***

**Purpose** —

**Details** — The different distributions require different settings.

**Additional information** —

**Transition statement** — Next: Checkpoint

## Checkpoint

---

1. What is profile specification?  
\_\_\_\_\_
2. What is the function of Process Cases Summary?  
\_\_\_\_\_
3. What is dynamic analysis?  
\_\_\_\_\_
4. Which analysis shows the differences and similarities in simulation results between two different simulation runs?  
\_\_\_\_\_
5. What is the advantage of using statistical distributions in simulation?  
\_\_\_\_\_

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Figure 4-25. Checkpoint

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### **Notes:**

Write your answers here:

- 1.
- 2.
- 3.
- 4.
- 5.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Unit summary

## Unit summary

---

Having completed this unit, you should be able to:

- Conduct profile analysis using profile specification and case summary
- Conduct dynamic analysis from simulation results

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Figure 4-26. Unit summary

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint solution

## Checkpoint solution

---

1. What is profile specification?  
Profile specification provides a way of reviewing, documenting, and validating the values that are used during the run of a simulation
2. What is the function of Process Cases Summary?  
Process Cases Summary shows each of the process cases (paths) through the process
3. What is dynamic analysis?  
Analysis of the results of a process simulation from different perspectives: Time, money, and statistics Which analysis shows the differences and similarities in simulation results
4. Which analysis shows the differences and similarities in simulation results between two different simulation runs?  
Processes Comparison Analysis
5. What is the advantage of using statistical distributions in simulation?  
Build randomness into a model

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Figure 4-27. Checkpoint solution

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Exercise overview

## Exercise overview

---

In this exercise you will:

- Use profile analysis
- Use dynamic analysis and aggregated analysis
- Use dynamic analysis — process analysis
- Generate and export reports
- Set up a simulation
- Run a simulation and generate analysis

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Figure 4-28. Exercise overview

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### **Notes:**



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —**



# Unit 5. Process improvement

## Estimated time

00:45

## What this unit is about

This unit describes the process improvement.

## What you should be able to do

After completing this unit, you should be able to:

- Describe strategies for improving processes
- Demonstrate best practices for analysis using WebSphere Business Modeler
- Use process model comparisons

## How you will check your progress

- Checkpoint
- Lab exercises

## References

None

## Unit objectives

---

After completing this unit, you should be able to:

- Describe strategies for improving processes
- Demonstrate best practices for analysis using WebSphere Business Modeler
- Use process model comparisons

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Figure 5-1. Unit objectives

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### **Notes:**

***Instructor notes:***

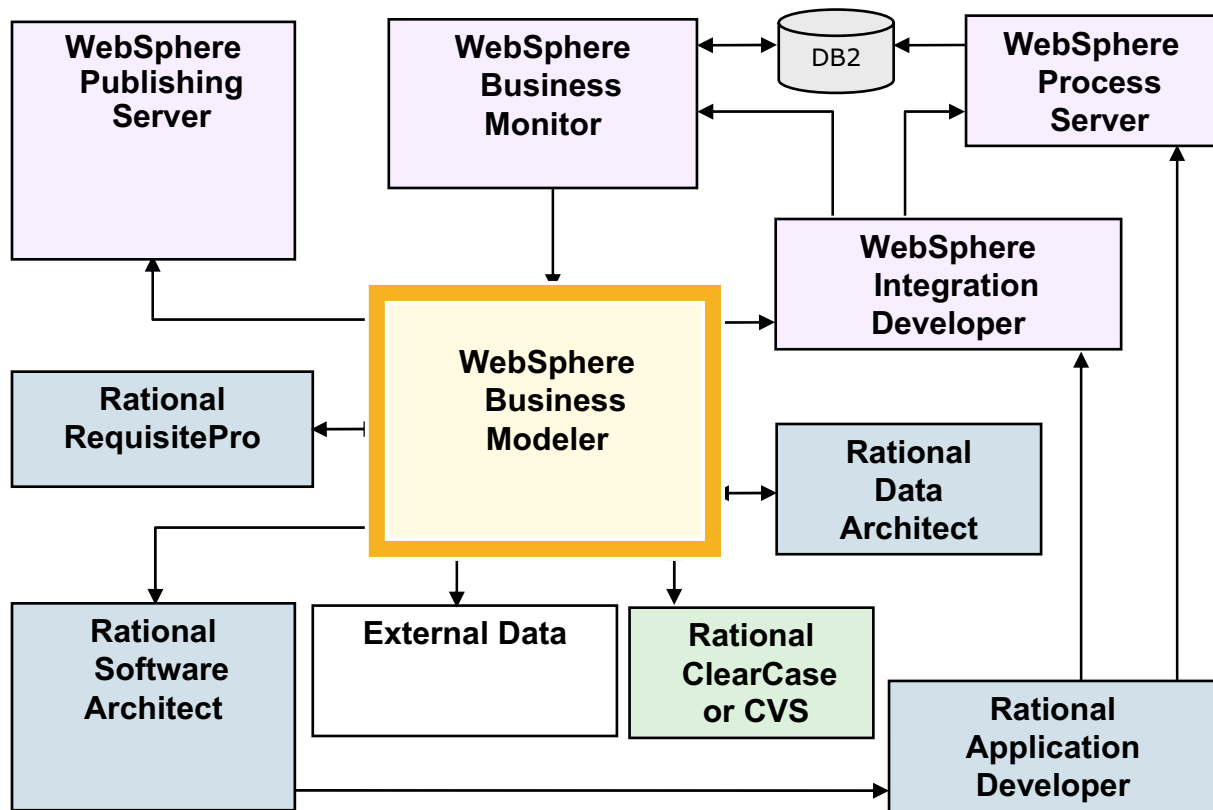
**Purpose** — To introduce the content of this unit.

**Details** —

**Additional information** —

**Transition statement** — Next: Using Modeler to improve business processes

## Using Modeler to improve business processes



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Figure 5-2. Using Modeler to improve business processes

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### Notes:

1. A process model is built using existing information or future design information in WebSphere Business Modeler.
2. Supporting information can be imported (existing Visio models, business items, business services) to support the development of the model.
3. Versions of the process model are stored in a repository for security and control using Rational ClearCase or CVS.
4. Additional IT information can be imported from Rational Data Architect to support development.
5. Business requirements are synchronized with the process model using Rational RequisitePro.
6. Models are exported to WebSphere Publishing Server for review using a Web browser during development and later in production.
7. When the new process is ready for development UML to build new services is exported to Rational Software Architect.

8. Once the software design is done the code is developed in Rational Application Developer and exported for further development and execution.
9. Workflow code is developed in WebSphere Integration Developer using the base BPEL from the model and the WSDLs that were developed. The completed code is exported for execution and monitoring.
10. The workflow code is executed on WebSphere Process Server and production data is exported for monitoring and reporting.
11. Production data is monitored by management using WebSphere Business Monitor and information is passes back to modeler for future analysis.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Audience perspectives



## Audience perspectives

- To evaluate alternative solutions, it is necessary to understand the audience perspectives of model content.
- Content relates to the process objects and the data contained in each object.
- A company executive may not need to see detailed task interactions with various applications, as would a software architect.
  - However, the data needs to be in Modeler's repository.
    - Modeler provides for this using subprocesses and in setting the operational mode.
  - Model content should reflect the needs of the intended audience.
  - Models can store content for multiple audiences, so filter the content for a presentation to reduce or avoid confusing a specific audience.

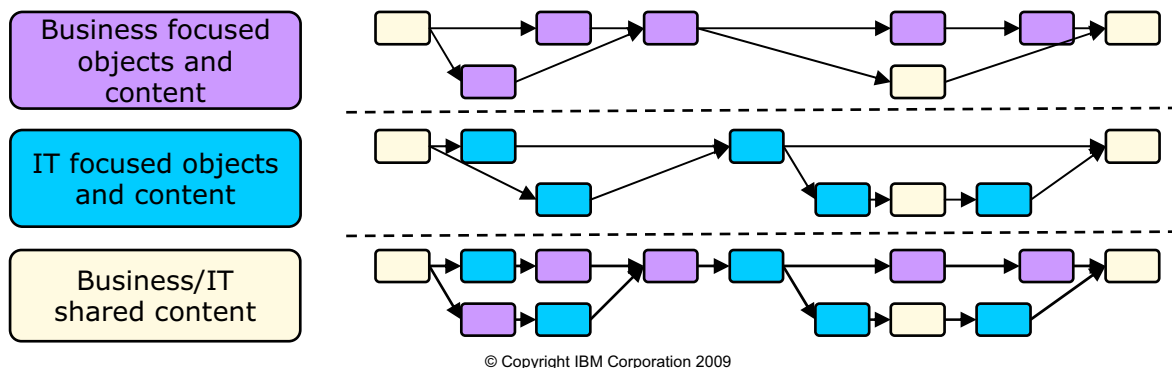


Figure 5-3. Audience perspectives

WB286 / VB2861.0

### Notes:

## ***Instructor notes:***

### **Purpose —**

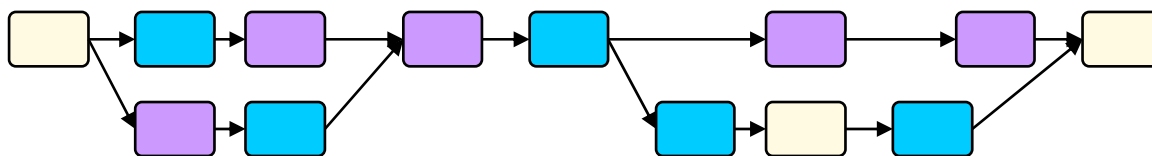
**Details —** Different people want to see different things, so the model should not only focus on one point of view. Here you see a shared model that focuses on two different audiences by using classification. From this the audience can understand where they fit and understand that there is a much bigger process in place.

### **Additional information —**

**Transition statement —** Next: Comprehensive model

## Comprehensive model

- Evaluation of all alternative solutions requires understanding the comprehensive model.
- Comprehensive models contain shared content and shared process flows.
  - Model diagram (process flow) represents tasks for people and systems, their inputs and outputs, and the decisions that direct the flow of the key business item.
  - Model elements contain data that is relevant to both business and technology.
- Process re-engineering requires the analysis of:
  - Business
  - People
  - Process
  - Technology



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Figure 5-4. Comprehensive model

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### Notes:

***Instructor notes:***

**Purpose —**

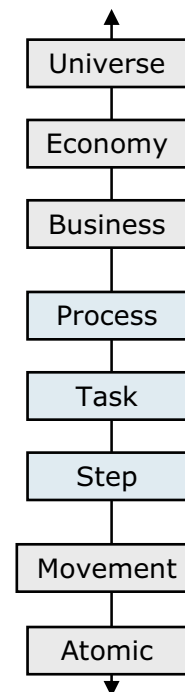
**Details —** You can also create subprocesses for certain areas. It reduces the complexity but still shows the type of work being performed.

**Additional information —**

**Transition statement —** Next: Balance of content versus level of detail

## Balance of content versus level of detail

- Content refers to the data collected about each process object.
  - Summary content may include the task name and the role of the person responsible for its execution.
  - Detailed content might include: task name, role, duration, cost, application resources, bulk resources, departmental structure, and inputs.
- Level of detail refers to how the process is described.
  - A high level of detail for sending a letter could be a task.
    - “Send letter”
  - At a lower level of detail:
    - Fold completed letter
    - Place in envelope
    - Seal envelope
    - Address and stamp envelope
    - Deliver to mailbox



One task may represent five steps from a lower level of detail.

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Figure 5-5. Balance of content versus level of detail

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### Notes:

Successful evaluation of the alternatives also requires a balance of content versus level of detail.

## ***Instructor notes:***

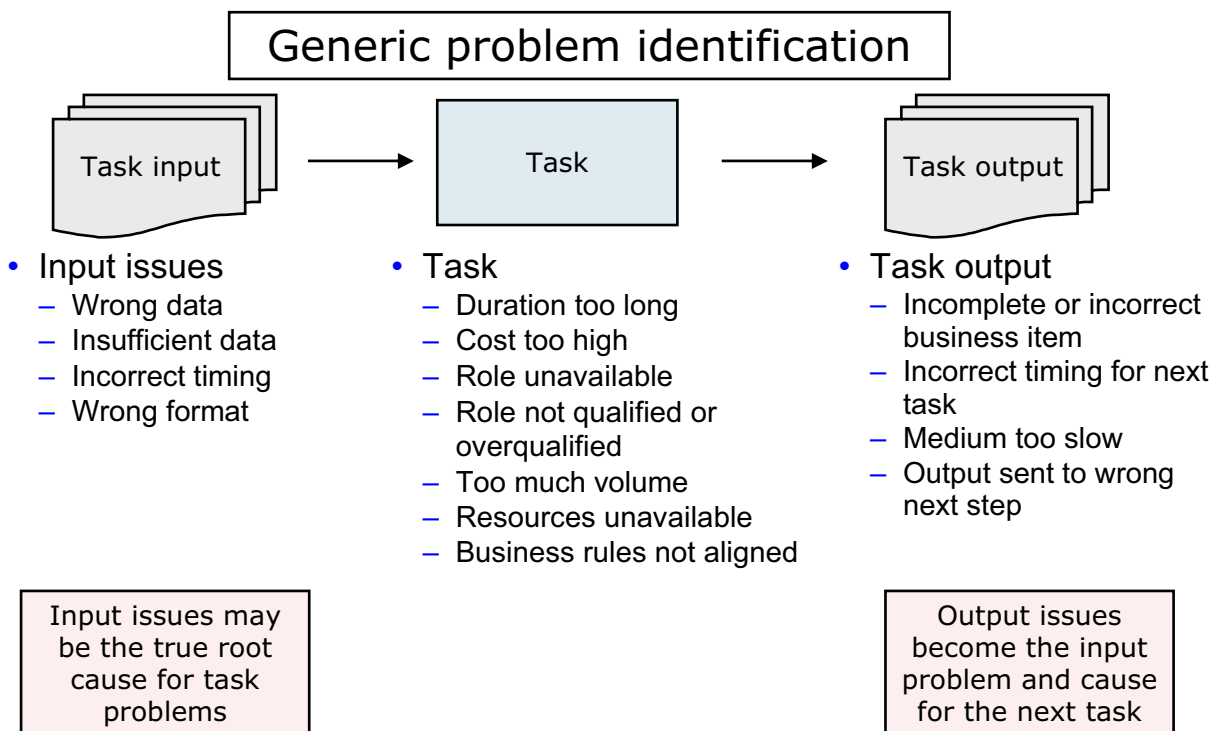
### **Purpose —**

**Details —** Content refers to how much different data is collected, process, resources, organization, business items, and so forth. Detail refers to the amount of data in a specific area like process or resources.

### **Additional information —**

**Transition statement —** Next: Root cause analysis

## Root cause analysis



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Figure 5-6. Root cause analysis

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### Notes:

The most desirable solution may be too aggressive and attempt to address too many of the process problems.

## ***Instructor notes:***

### **Purpose —**

**Details —** This is a single slide representing root cause analysis. You can start with the last output of a process and work you way backward through the process asking why.

If there is a problem with the last output, was it caused by the prior task? If there was a problem in the task, was it caused by the input? If there was a problem with the input, was it because of the output? If there was a problem with the output, was caused by the task? Continue in this way until you get to the starting input.

### **Additional information —**

**Transition statement —** Next: Process issues affect business goals



## Process issues affect business goals

---

- Business processes break down for a number of reasons.
  - Many of them are hidden and difficult to isolate.
- A model can reduce process complexity by highlighting areas with known problems when the model is constructed, including:
  - Multiple iterations
  - High costs
  - Long process delays
  - Limited or too many resources
  - Bottlenecks

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Figure 5-7. Process issues affect business goals

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### **Notes:**

The best alternative is a based on a modeling that isolates business issues which are most important to the goals.

***Instructor notes:***

**Purpose —**

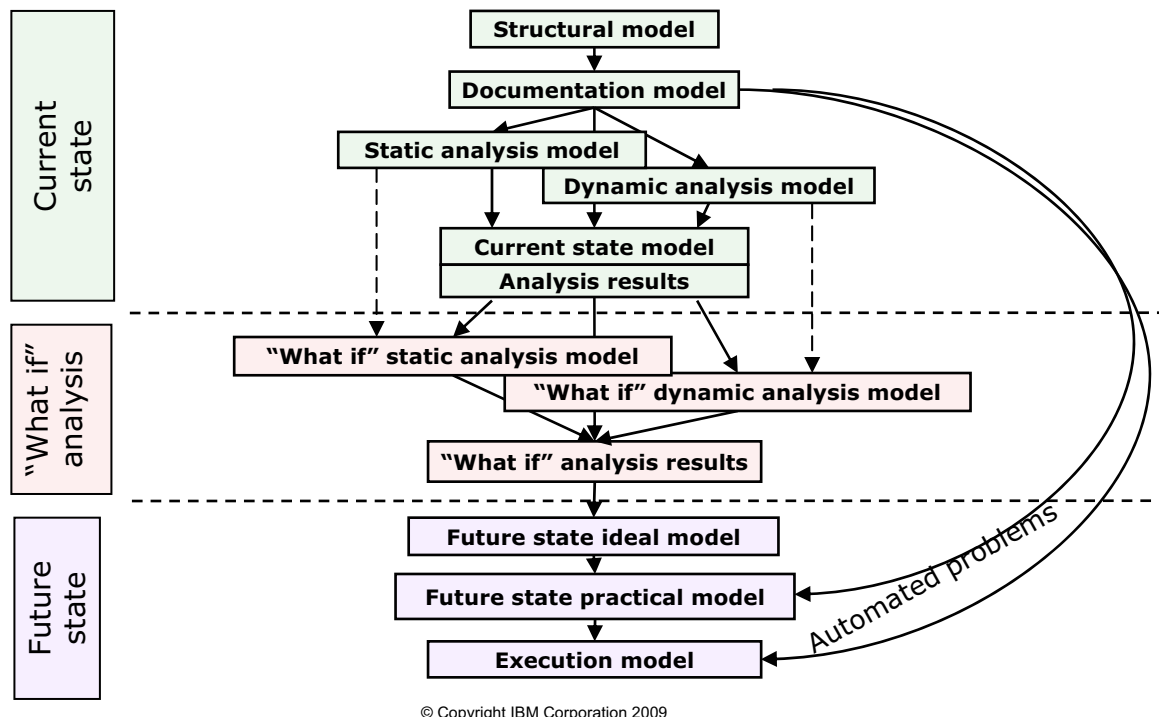
**Details —** You can look for the root of the problem by isolating the business issues and focusing on them.

**Additional information —**

**Transition statement —** Next: Future process model

## Future process model

- The diagram illustrates how each model becomes the foundation for the next phase.
  - The structural model facilitates the documentation of the current state, models are analyzed, results are published, and so on.



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Figure 5-8. Future process model

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### Notes:

The final future process model will be selected in the later phases of the project

Boxes in bold are deliverables for each phase.

This diagram shows that each of the model iterations or versions is the foundation for future model iterations or versions.

The reveal shows "Automated Problems" if you skip from current state process identification straight to the future state business and execution models without performing any analysis.

There is actually some analysis in future state as well, although it is not shown.

***Instructor notes:***

**Purpose —**

**Details —** If you skip analysis, you may improve on the way you deliver problems.

**Additional information —**

A lack of analysis may only fix a symptom while automating the problem

**Transition statement —** Next: Process model phases: task details

## Process model phases: task details

- The flow below describes the same set of processes at different points in the life cycle.
  - As a process is refined through its life cycle, the emphasis on certain process details may shift.
  - The tasks and content defined for a business owner may be less relevant to an IT solution lead developing workflow.

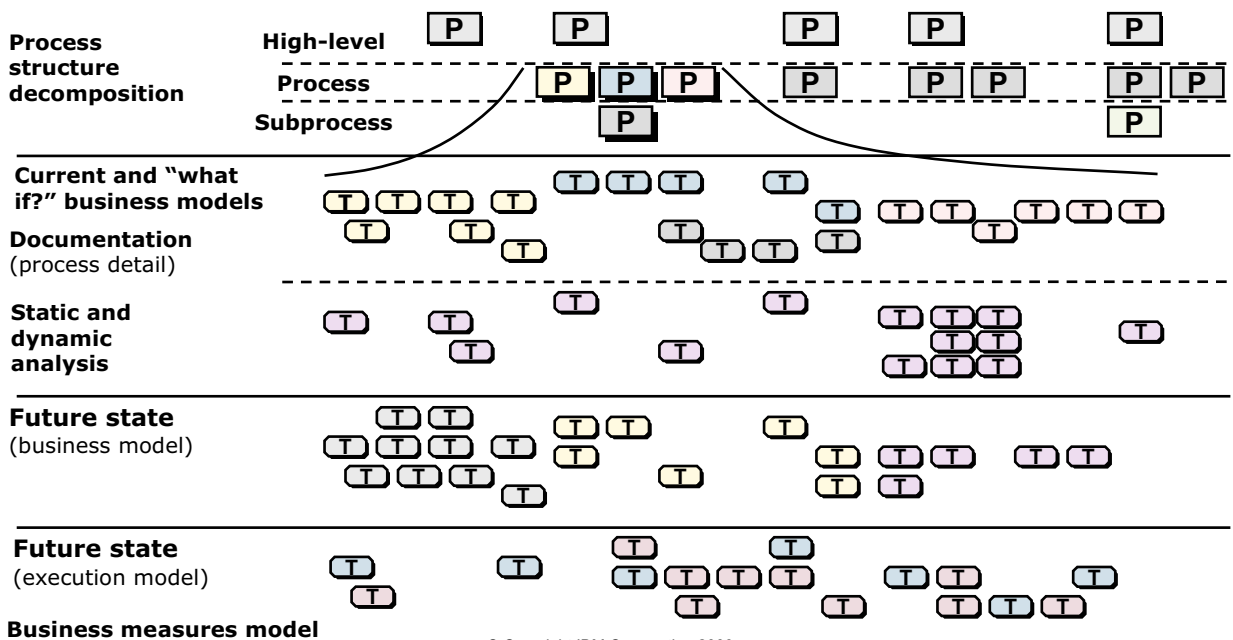


Figure 5-9. Process model phases: task details

WB286 / VB2861.0

### Notes:

In this example, you take a single end-to-end process (identified at the high level in line one) and break it down.

- In the first two lines, it becomes three processes and a subprocess.
- In current state onwards, you see the processes broken down into tasks.
- In current state analysis, you decide to focus on the back end of the process, and so break out those tasks into more detail. At the front end of the process, you aggregate the tasks into a higher level view as you are not interested in analyzing this part. You can have a process where there are tasks at different levels of detail in the same model, depending on what information is required for analysis.
- In the future state, you see that by putting some extra manual effort up front in the process, you can solve the problems you were having at the end.
- In the execution model, you see that the back end of the process is now automated, as the complexity is removed by spending the manual effort up front in the process.

- In the business measures model (white), you see the points at the beginning and ends of pieces of work where you want to capture metrics.

***Instructor notes:*****Purpose —**

**Details —** The key point is that you do not work on everything at once. You pick a process and drill down to implementation, and then pick another process.

**Additional information —**

**Transition statement —** Next: Business analysis components

## Business analysis components

- **Process goals:** The purpose of the project or process.
- **Metrics:** Process analysts identify what to capture in the model.
  - What the model needs to produce for reporting and analysis.
- **Proficiencies:** Identify what the process and participants do well.
- **Pain points:** Provide focus for model creation and analysis.
  - Model should be able to prove or disprove these claims through the quantification of the process data.

<b>Process goals</b> <ul style="list-style-type: none"> <li>• Reduce the cost of a claim</li> <li>• Meet corporate financial goals</li> <li>• Satisfy customer with improved cycle time</li> <li>• Reduce rework</li> <li>• Reduce mistakes and improve data integrity</li> </ul>	<b>Metrics</b> <ul style="list-style-type: none"> <li>• Percent of time claim is approved</li> <li>• Percent of time credit information is inaccurate</li> <li>• Percent of time rework is required</li> <li>• Overall process time and cycle time</li> </ul>
<b>Proficiencies</b> <ul style="list-style-type: none"> <li>• Experienced team</li> <li>• Openness to critique and change</li> <li>• Process flexibility</li> <li>• Claims</li> </ul>	<b>Pain points</b> <ul style="list-style-type: none"> <li>• High-level direction not adequate</li> <li>• Client information is duplicated</li> <li>• Cost tables are inconsistent</li> <li>• Reporting needs improvement</li> <li>• Need collaboration between underwriting and billing</li> </ul>

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Figure 5-10. Business analysis components

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### Notes:



***Instructor notes:***

**Purpose —**

**Details —** Every project should document these four areas.

**Additional information —**

**Transition statement —** Next: Sample business analysis

## Sample business analysis

---

- Process overview (work steps)
  - 198 steps in the product development process
    - 171 internal activities
    - 27 external activities
- Task classification
  - 35% of steps add value to the product
  - 50% are related to data entry
  - 35% are related to tracking information or products
  - 32% are approval tasks
- Information (inputs and outputs)
  - 73 pieces of information used in the process
    - Documents, spreadsheets, reports, bill of materials, hardware
  - Information handed off 387 times
  - On average, each piece of information moved about five times

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Figure 5-11. Sample business analysis

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —** Detailed analysis is at the heart of process improvement.

**Additional information —**

**Transition statement —** Next: Sample “what if?” scenarios

## Sample “what if?” scenarios

Current state variables and analysis results			“What if?” assumptions and results are analyzed to achieve best future state					Combination of all assumptions yields the ideal future state
Results		As is	Delivery	Fax and printing	Data quality	Improve technology	Process	All
	<b>METRICS</b>							
	Process time (days)	7.58	7.37	7.58	6.02	7.58	7.23	5.38
	Working time (hours)	30.15	26.52	21.82	26.98	25.77	23.00	15.13
Task variables	Resource cost	\$46.44	\$41.49	\$35.17	\$41.49	\$37.51	\$32.29	\$20.34
	<b>TASKS (values in minutes)</b>							
	Receive request	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	Review customer request	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	Contact customer	4.7	4.7	4.7	4.7	4.7	4.7	4.7
	Contact internal team	4.7	4.7	4.7	4.7	4.7	4.7	2.4
	Create draft order for review	7.1	7.1	3.6	7.1	4.7	4.7	3.6
	Review order for quality	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Pick order	4.7	2.4	4.7	4.7	4.7	4.7	2.4
	Ship order	3.6	2.4	3.6	3.6	3.6	2.4	2.4
Decision variables	Paperwork distribution (acct)	1.2	1.2	1.2	1.2	0.0	0.6	0.0
	File order	1.2	1.2	1.2	1.2	1.2	0.0	0.0
	<b>DECISION choices</b>							
	Re-contact customer?	20%	15%	20%	20%	20%	20%	5%
	Call internal team?	20%	20%	20%	20%	20%	20%	5%
	Fax and print correctly	75%	75%	95%	75%	75%	75%	95%
	Quality check (pass)	23%	23%	23%	10%	23%	20%	10%

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Figure 5-12. Sample “what if?” scenarios

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### Notes:

***Instructor notes:*****Purpose —**

**Details —** Usually when trying multiple alternatives at the same time they conflict with each other, so you need to make sure the things that are put together work together. This is a way of showing the starting performance, all of the alternatives, and the combined performance.

**Additional information —**

**Transition statement —** Next: A case for change

## A case for change

---

- Deciding what to present to build a case for change
- Expansion versus decomposition
  - Expand the high-level diagram or decompose it?
  - Or use a combination of expansion and decomposition?

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Figure 5-13. A case for change

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —** This is about deciding how much detail should be shown on a model.

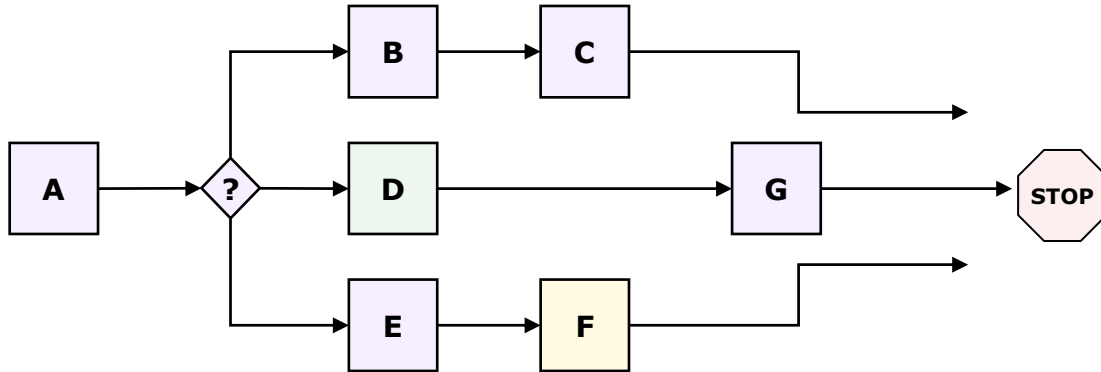
**Additional information —**

**Transition statement —** Next: Expansion versus decomposition: high level

## Expansion versus decomposition: high level

---

- The high-level perspective provides a contextual end-to-end diagram.



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Figure 5-14. Expansion versus decomposition: high level

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### Notes:



***Instructor notes:***

**Purpose —**

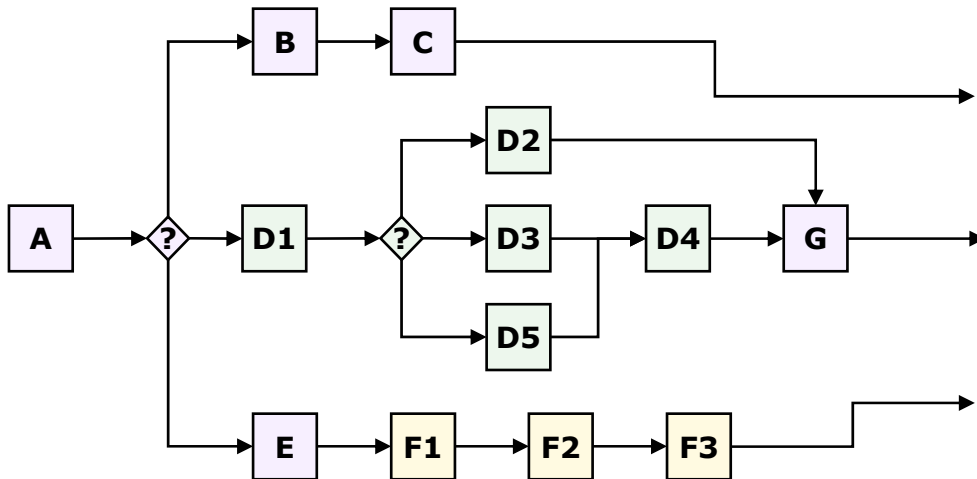
**Details —** The high level model looks rather simple. Nodes D and F have more information enclosed.

**Additional information —**

**Transition statement —** Next: Expansion

## Expansion

- Expansion enforces collaboration by providing impact visibility, but the diagram becomes complex.



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Figure 5-15. Expansion

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### Notes:

***Instructor notes:*****Purpose —**

**Details —** Once you expand the nodes, you can see the details in a more complex diagram. Sometimes it is best to show the detail, while other times it is the best to leave it contained in the subprocess.

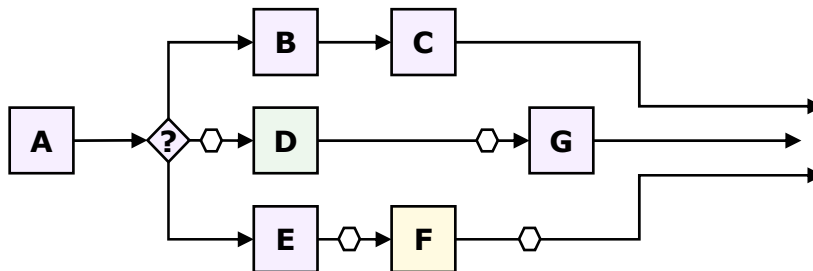
**Additional information —**

**Transition statement —** Next: Decomposition (1)

## Decomposition (1)

---

- Decomposition establishes boundaries, thereby enforcing silos, but may lead to oversimplification.



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Figure 5-16. Decomposition (1)

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### Notes:

***Instructor notes:***

**Purpose —**

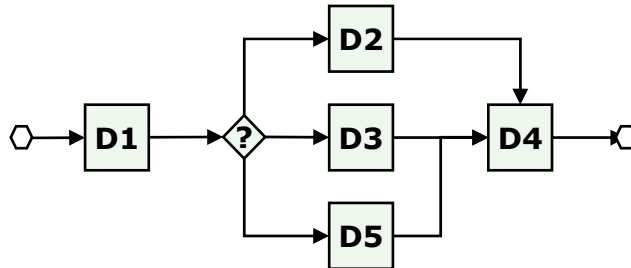
**Details —** If you want to decompose, then you should come up with logical boundaries so that people know a subset of the process exists.

**Additional information —**

**Transition statement —** Next: Decomposition (2)

## Decomposition (2)

- Expansion of D as a separate subprocess
  - Note that this information may be lost in decomposition, although it was visible in expansion.



- Expansion of F as a separate subprocess
  - Note that F is a stand-alone process and matches the boundaries.



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Figure 5-17. Decomposition (2)

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### Notes:

***Instructor notes:***

**Purpose —**

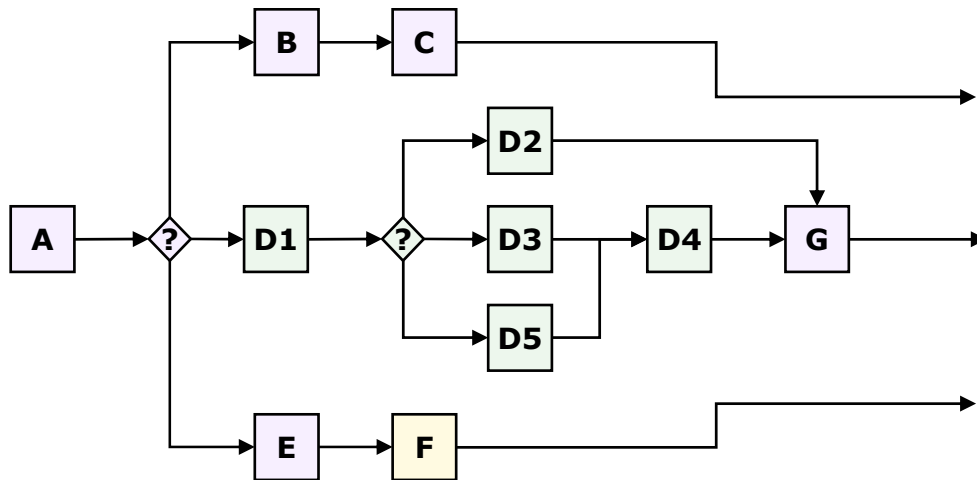
**Details —**

**Additional information —**

**Transition statement —** Next: Expansion versus decomposition: both

## Expansion versus decomposition: both

- Expand where collaboration occurs and decompose where boundaries are clearly defined.



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Figure 5-18. Expansion versus decomposition: both

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### Notes:



***Instructor notes:*****Purpose —**

**Details —** A combination of both methods may be optimal. Expose (expand) areas of interest and hide (decompose) areas of little concern.

**Additional information —**

**Transition statement —** Next: Expansion versus decomposition: subprocesses

## Expansion versus decomposition: subprocesses

---

- Logical collection of tasks and decisions that generate an output
- When to use:
  - When the collection of tasks is reused in multiple processes across functional areas
  - To simplify a long set of tasks which are not relevant to the picture, but relevant to the data being analyzed
- Subprocesses: The exception rather than the rule
- Driven from an end-to-end perspective
- Establish boundaries through process decomposition
- Example:
  - An imaging process converts paper documents into electronic form.
    - This subprocess could appear in many processes whenever a paper document is required in electronic format.
    - The details of this subprocess are not important to the picture of the process containing it, but the details are relevant to the calculations (data) of cost.

---

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Figure 5-19. Expansion versus decomposition: subprocesses

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —** Guidelines for deciding how to present.

**Additional information —**

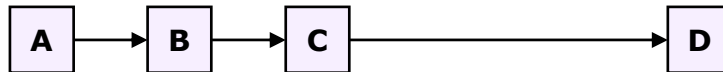
**Transition statement —** Next: Modeling for rework and process volume

## Modeling for rework and process volume

- Modeling to show activities
  - Different ways of drawing the flow means different things.

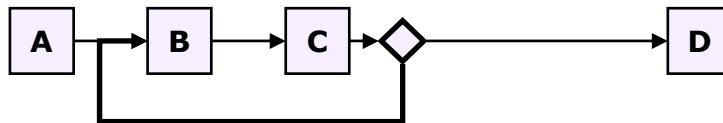
### Tasks

As they occur in a perfect process



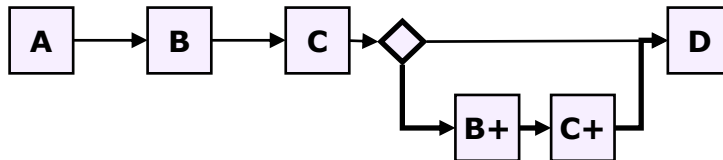
### Tasks — Resource perspective

Showing rework as a function of resources — described as a role or resources loop  
*Resources often rework activities B and C*



### Tasks — Sequence perspective

Showing rework as a function of the sequence of steps over time — described as additional tasks  
*Resources often rework activities B and C drawn to illustrate — cannot go back in time*



Time

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Figure 5-20. Modeling for rework and process volume

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### Notes:

Here you have a straight sequence of tasks. However, from time to time the tasks are done incorrectly and you say “go back to step B and do it again”. In fact, what is happening is the work is being returned to the resource, but not to the task. The task has changed (B+) because the work may be described as “correct” form (rather than “complete” form) -- two entirely different things. Therefore, to correctly model the process as it occurs from the perspective of the work product, you would see the bottom sequence.

***Instructor notes:*****Purpose —**

**Details —** A human process very seldom returns to an earlier place in the process. There is almost always something different done the second or third time.

**Additional information —**

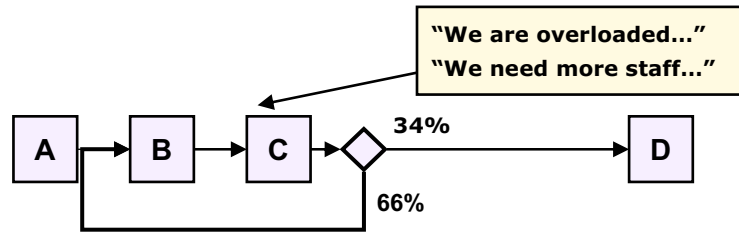
**Transition statement —** Next: Rework and process volume: pain points

## Rework and process volume: pain points

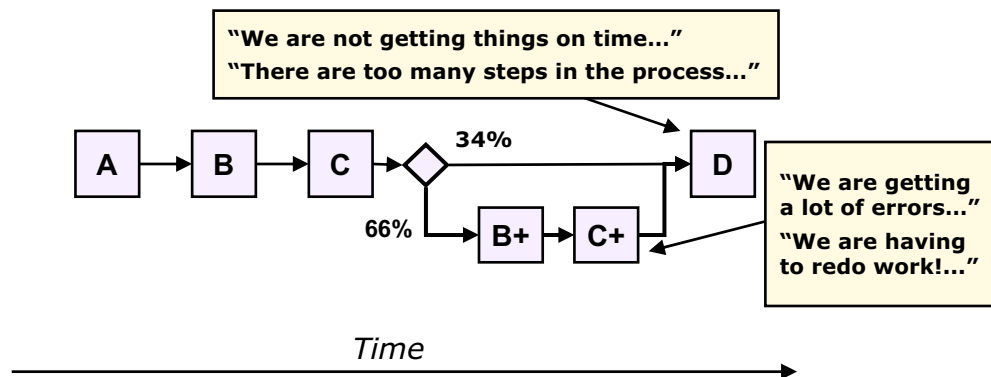
- Pain points recorded from subject matter experts, as a result of process volume

### Resource perspective

Modeled where the jobs are not returned to the same individual — in a rework loop



### Sequence perspective



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Figure 5-21. Rework and process volume: pain points

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### Notes:

In the pain points on the top scenario, the resources performing tasks B and C are overloaded. They are performing the work once; then 66% of the time, they are doing it again.

***Instructor notes:*****Purpose —**

**Details —** With Sequence perspective, it shows there are a lot of things to do and rework is needed to fix errors. It also says although these tasks are done by the same person, they are being done differently.

**Additional information —**

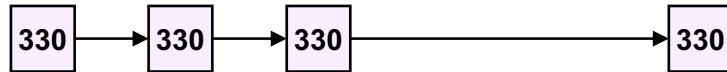
**Transition statement —** Next: Rework: volume

## Rework: volume

- Modeling to show the volume (throughput) impact on the process

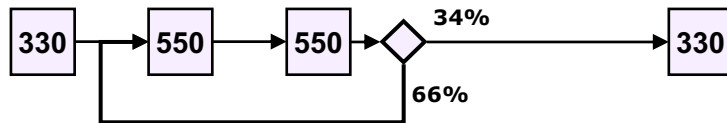
### Tasks

As they occur in a perfect process



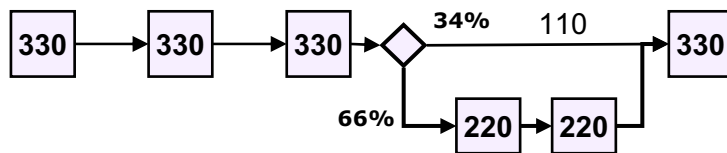
### Tasks — Resource perspective

Showing rework as a function of resources — described as a role or resources loop



### Tasks — Sequence perspective

Showing rework as a function of the sequence of steps **over time** — described as additional tasks



Time

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Figure 5-22. Rework: volume

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### Notes:

Here you see manifesting as 550 tokens in volume for the two tasks, but this work is hidden to the eye. It can only be visually shown in the button sequence (where the repeated steps are broken out separately).



***Instructor notes:*****Purpose —**

**Details —** It is important to listen carefully to what people are saying so you can represent the real process more accurately.

**Additional information —**

**Transition statement —** Next: Process goal analysis

## Process goal analysis

---

- Process goals are derived from specific organization goals and customer requirements.
  - Organizations achieve their goals through the operations of their processes.
- Process goal analysis is used to analyze a process to determine how well it supports the organization's goals.
  - The performance of the process is analyzed and evaluated against its goals.
  - Goal analysis allows the focus to be set on increasing the probabilities of process cases that support organizational goals.
    - Therefore, it reduces the probabilities of cases that do not support goals.

---

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Figure 5-23. Process goal analysis

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### **Notes:**

***Instructor notes:*****Purpose —**

**Details —** You use process goal analysis to analyze your process and determine how well it supports organization goals. Focusing on the paths that support your goals helps you understand where to improve. You also try to reduce the probability of going to the paths that do not support your goals.

**Additional information —**

**Transition statement —** Next: Redesign analysis

## Redesign analysis

---

- Shows the effects of adding tasks to, or deleting tasks from, a process during the redesign phase
- Use redesign analysis when you need to:
  - Identify improvement opportunities within a process
  - Measure the effects of redesigning a process

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Figure 5-24. Redesign analysis

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### **Notes:**

***Instructor notes:*****Purpose —**

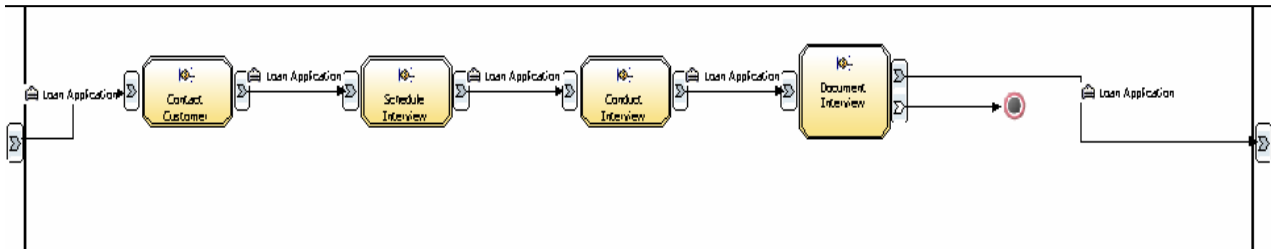
**Details —** Documenting and understanding the current process is important in redesigning the future process. You need a good base to start from so you can compare the differences. You need to try different alternatives to see which ones give the most improvement.

**Additional information —**

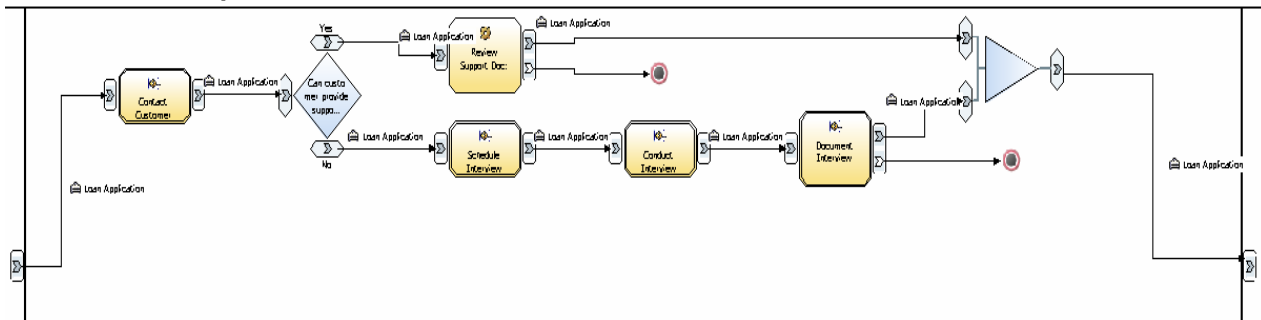
**Transition statement —** Next: Redesign the process

## Redesign the process

- “As-is” process



- “To-be” process



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Figure 5-25. Redesign the process

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### Notes:

***Instructor notes:*****Purpose —**

**Details —** Just because the as-is process is straight and clean does not mean it is the most efficient. In this case everything has to pass through all the tasks. The to-be process bypasses some of the unnecessary tasks, making it look less clean but more efficient.

**Additional information —**

**Transition statement —** Next: Comparison analysis

## Comparison analysis

---

- Once simulations complete, dynamic analysis reports can be run
  - Comparing the results from the As Is and each of the To Be alternatives
  - Process comparison reports show how the To Be process expects to perform versus the As Is
    - Trying to reduce the process cycle times and the costs in the To Be version

Processes Duration Comparison   Simulation result - Current   Verify Credit - Current Wednesday, October 29, 2008 8:57:20 PM   10:55:				
	Simulation Result Name	Process Name	Average Elapsed Duration	Average Throughput
	Simulation result - Current	Verify Credit - Current	11 hours 46 minutes 39...	0.08 work item / hour
	Simulation result - Future	Verify Credit - Future	5 hours 15 minutes 59....	0.19 work item / hour
Difference			6 hours 30 minutes 39....	-0.10 work item / hour
Percentage Change			55.28%	-123.63%

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Figure 5-26. Comparison analysis

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### Notes:



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint

## Checkpoint

---

1. What types of analysis should be used for process re-engineering?  
\_\_\_\_\_
2. What is process goal analysis?  
\_\_\_\_\_
3. When do you need to conduct redesign analysis?  
\_\_\_\_\_
4. What are the four business analysis components?  
\_\_\_\_\_

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Figure 5-27. Checkpoint

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### **Notes:**

Write your answers here:

- 1.
- 2.
- 3.
- 4.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Unit summary

## Unit summary

---

Having completed this unit, you should be able to:

- Describe strategies for improving processes
- Demonstrate best practices for analysis using WebSphere Business Modeler
- Use process model comparisons

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Figure 5-28. Unit summary

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint Solution

## Checkpoint Solution

---

1. What types of analysis should be used for process re-engineering?  
Business, people, process, and technology
2. What is process goal analysis?  
Process goal analysis is used to analyze a process to determine how well it supports the organization's goals. The performance of the process is analyzed and evaluated against its goals. It allows the focus to be set on increasing the probabilities of process cases that support organizational goals
3. When do you need to conduct redesign analysis?  
When you want to identify improvement opportunities within a process or measure the effects of redesigning a process
4. What are the four business analysis components?  
Process goals, metrics, proficiencies and pain points

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Figure 5-29. Checkpoint Solution

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Exercise overview

## Exercise overview

---

In this exercise you will:

- Redesign your model
- Set up simulation settings for the redesigned model
- Run simulations and generate analyses for the redesigned model
- Compare simulation results

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Figure 5-30. Exercise overview

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### **Notes:**



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —**



# Unit 6. Custom reports and queries

## Estimated time

00:45

## What this unit is about

This unit describes the custom reports and queries.

## What you should be able to do

After completing this unit, you should be able to:

- Explain the process of creating custom reports
- Create report templates using data sources
- Export reports
- Use predefined and custom queries

## How you will check your progress

- Checkpoint
- Lab exercises

## References

None

## Unit objectives

---

After completing this unit, you should be able to:

- Explain the process of creating custom reports
- Create report templates using data sources
- Export reports
- Use predefined and custom queries

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Figure 6-1. Unit objectives

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### **Notes:**

***Instructor notes:***

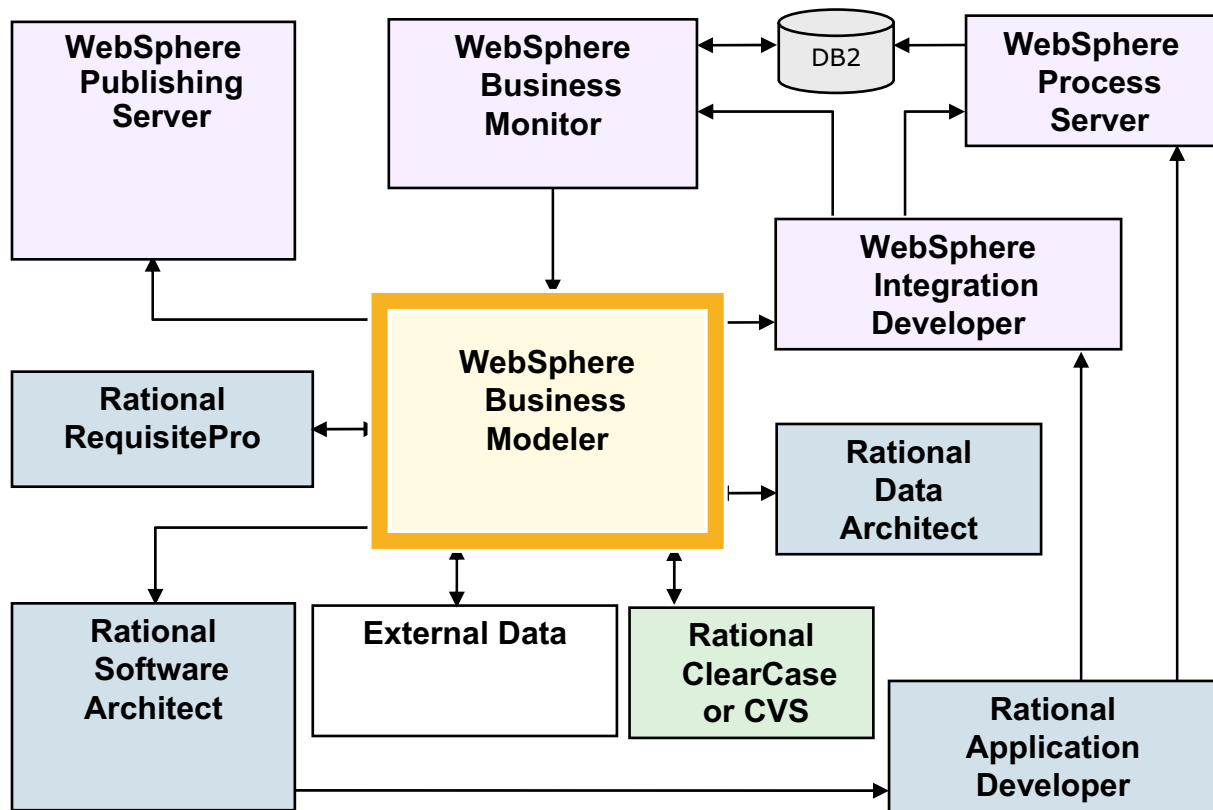
**Purpose** — To introduce the content of this unit.

**Details** —

**Additional information** —

**Transition statement** — Next: Creating custom reports in Modeler

## Creating custom reports in Modeler



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Figure 6-2. Creating custom reports in Modeler

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### Notes:

1. A process model is built using existing information or future design information in WebSphere Business Modeler.
2. Supporting information can be imported (existing Visio models, business items, business services) to support the development of the model.
3. Versions of the process model are stored in a repository for security and control using Rational ClearCase or CVS.
4. Additional IT information can be imported from Rational Data Architect to support development.
5. Business requirements are synchronized with the process model using Rational RequisitePro.
6. Models are exported to WebSphere Publishing Server for review using a Web browser during development and later in production.
7. When the new process is ready for development UML to build new services is exported to Rational Software Architect.

8. Once the software design is done the code is developed in Rational Application Developer and exported for further development and execution.
9. Workflow code is developed in WebSphere Integration Developer using the base BPEL from the model and the WSDLs that were developed. The completed code is exported for execution and monitoring.
10. The workflow code is executed on WebSphere Process Server and production data is exported for monitoring and reporting.
11. Production data is monitored by management using WebSphere Business Monitor and information is passes back to modeler for future analysis.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Reports



## Reports

---

- Reports are a formatted presentation of information relating to a model or to the results of analyzing a process simulation.
  - Predefined report details
    - Numerous predefined reports available in the product
  - Custom reports using report designer
    - Report catalogs
      - Organize report templates for different projects or uses
    - Report templates
      - Produce detailed reports with specific content in a specified format
    - Report style masters
      - Reuse header and footer content for multiple report templates
- Crystal Reports.
  - Alternative way of creating and generating report templates

---

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Figure 6-3. Reports

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Queries

## Queries

---

- Queries enable the extraction and viewing of selected information on elements in a model.
  - Predefined queries:
    - Several predefined queries can be used to extract and view a predefined set of information from a model.
  - Custom queries using query builder
  - Use the query builder to create queries

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Figure 6-4. Queries

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### **Notes:**

***Instructor notes:***

**Purpose —**

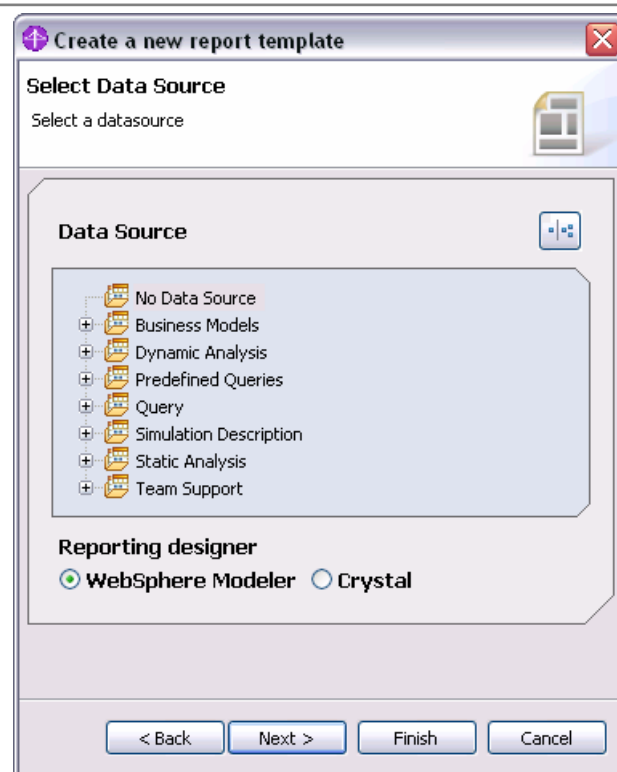
**Details —**

**Additional information —**

**Transition statement —** Next: Data sources

## Data sources

- Data sources are sets of information derived from project elements.
  - Use data sources as the basis for defining report templates in report designer.
- The data source depends on information to be provided by the report.
  - Reports on resources may use the resource specification data.
  - Reports on detailed process information may use the process specification data.



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Figure 6-5. Data sources

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### Notes:

## ***Instructor notes:***

**Purpose** — This slide defines data sources and explains how they are used.

**Details** — Data sources are sets of information that you can derive from elements of your project. You can use data sources as the basis for defining report templates.

When you create a new report template using Report Designer, you can specify the source of data that the report will use. The key to choosing the right data source for your report template is in considering what information you want your reports to provide. For example, if you are creating reports only on the resources in your model, you might choose the Resource Specification Data Source. If you need to include fields that provide detailed information related to your process, you might choose the Process Specification data source.

**Additional information** —

**Transition statement** — The next slide describes the categories of data sources available in WebSphere Business Modeler.

## Categories of data sources

Data source	Description
Business model	Information contained in business model
Dynamic analysis	Information returned by the different types of dynamic analysis
Predefined queries	Information contained within predefined queries included in the product
Query	Information from custom queries
Simulation description	Information contained in simulation profiles
Static analysis	Information returned by the different types of static analysis
Team support	Information contained in a repository location
No data source	Used to create a blank report template with no data source associated

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Figure 6-6. Categories of data sources

WB286 / VB2861.0

### Notes:

Each of these data source categories contains one or more options that you can choose to add to your report template. For example, in the Business Models category, you can choose any existing business model data source, such as Business Item Specification or Process Level Details. If you create the template without specifying the data source, you can add the data source later in the fields view.

Once you create a report template and specify its data source, you can work with the graphical editor and the fields view to select the specific fields to include in the report template from the list of all available fields in the data source.

Note: You can see a complete listing of the available fields for a data source by creating a report template that uses that particular data source.

### Business model data sources

Business Model data sources represent information that is contained in your business models.

### Dynamic analysis data sources

Dynamic analysis data sources represent information that is returned by the different types of dynamic analysis that you can perform on process simulations.

### **Query data sources**

Query data sources are based on queries that you have defined. Each results field that you define for the query is represented as a field in the data source.

### **Team support data sources**

Team support data sources represent information contained by a CVS repository location. The following data source is provided:

History report

**Note:** Because business services (WSDL files) and business service objects (XSD files) are stored by the model as external objects, information regarding them may not be consistently reported or displayed by the report templates.

**Note:** If a timetable refers to other timetables to define exemption periods, then any reports generated about the main timetable will also contain information about all of the timetables that it references.



**Instructor notes:****Purpose —**

**Details —** Depending on the contents of your model, you can select from the following categories of data sources:

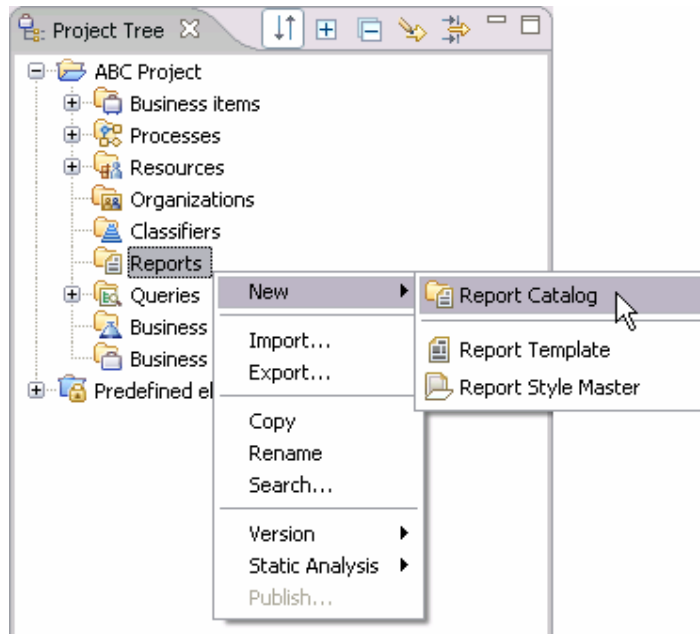
- No data source (to create a blank report template that does not have a data source associated to it)
- Business models
- Predefined queries
- Query (user-defined)
- Team support

**Additional information —**

**Transition statement —** Next: Creating report catalogs

## Creating report catalogs

- Report catalogs help organize report templates.
  - Created in the Project Tree



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Figure 6-7. Creating report catalogs

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Report templates

## Report templates

---

- Create detailed reports for your processes containing data that you have specified.
  - Use report designer to create report templates that have the exact content and presentation that you need.
- A report template can be run against different process models to generate results specific to each model.
  - An efficient way to create multiple reports that contain the specific information that you want to display.
    - For example, every report is required to have company name, address, and date.
- It can take some time to create and polish a template's design.
  - The effort invested in building a template provides the flexibility to generate any number of reports.

---

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Figure 6-8. Report templates

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Report designer (1)

## Report designer (1)

---

- The report designer, like the process editor and the structure editor, is a graphical editor with a palette that contains elements that can be added to the report template.
  - Pages and page breaks
  - Page headers and footers
  - Tables
  - Shapes, including lines, rectangles, circles, and ellipses
  - Static text fields
  - Pictures
  - Charts
  - Table of contents
  - Summary statistics fields (such as counts, sums, and averages for selected data fields)
  - Report special fields (such as page numbers, print date, and record number)
  - Groups (a set of reporting elements such as labels and data fields that can be repeated multiple times in a generated report)

---

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Figure 6-9. Report designer (1)

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

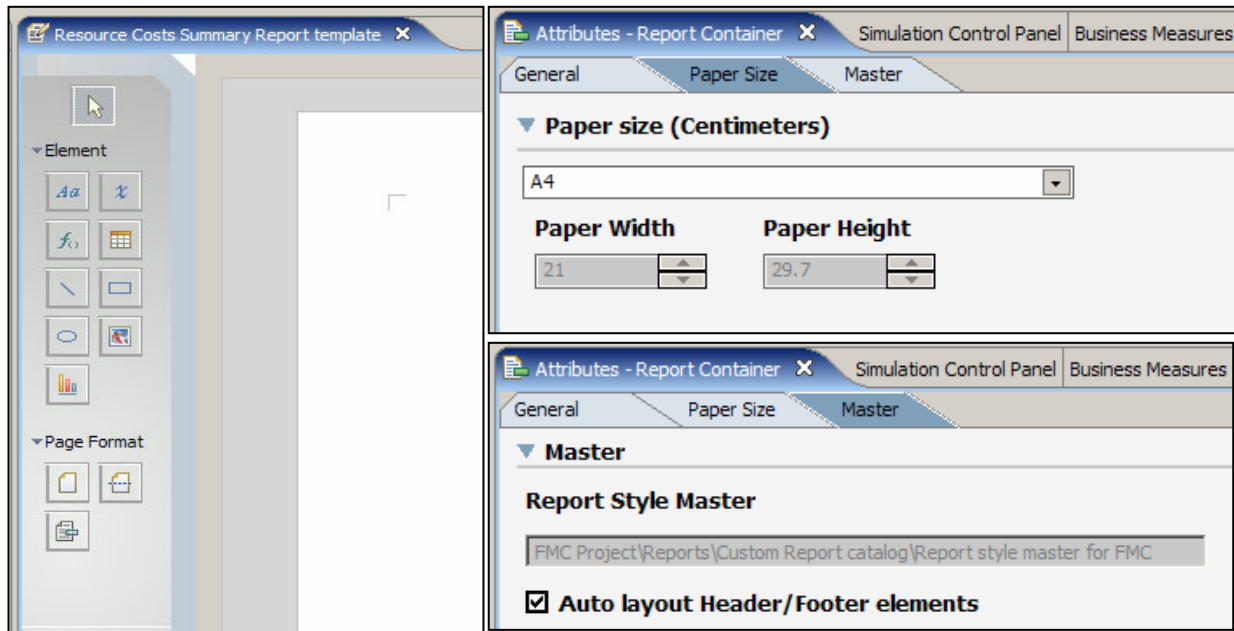
**Details —**

**Additional information —**

**Transition statement —** Next: Report designer (2)

## Report designer (2)

- Report designer provides many options for you to customize the appearance of elements that you add to the report template.
  - When an element is selected, the Attributes view can be used to edit the properties.



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Figure 6-10. Report designer (2)

WB286 / VB2861.0

### Notes:



***Instructor notes:***

**Purpose —**

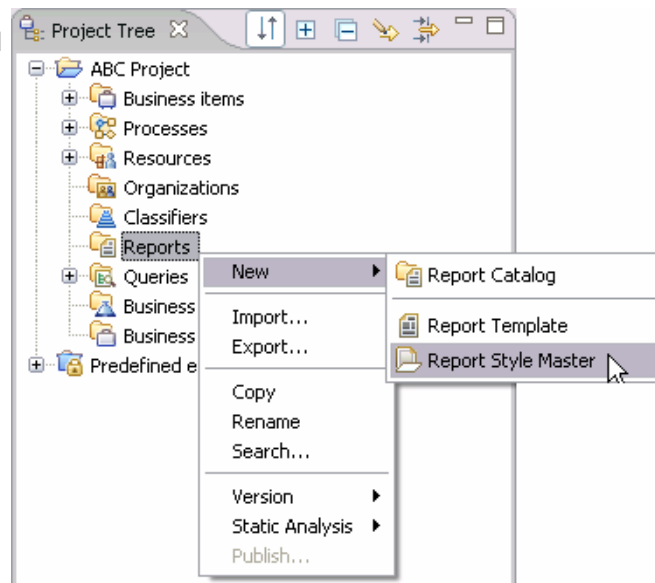
**Details —**

**Additional information —**

**Transition statement —** Next: Report style master (1)

## Report style master (1)

- Report style master enables you to reuse header and footer information for multiple report templates.
- Add your required fields once to a single report style master.
  - Apply that report style master to as many report templates as needed.
  - Every report template will have the same set of header and footer information.
- Report style masters can be applied to predefined or user-defined report templates.



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Figure 6-11. Report style master (1)

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### Notes:

For example, if you want your company name, company logo, and page numbers to appear in all your report templates, you could add those fields to an All Reports style master and then apply that style master to all of your report templates.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Report style master (2)

## Report style master (2)

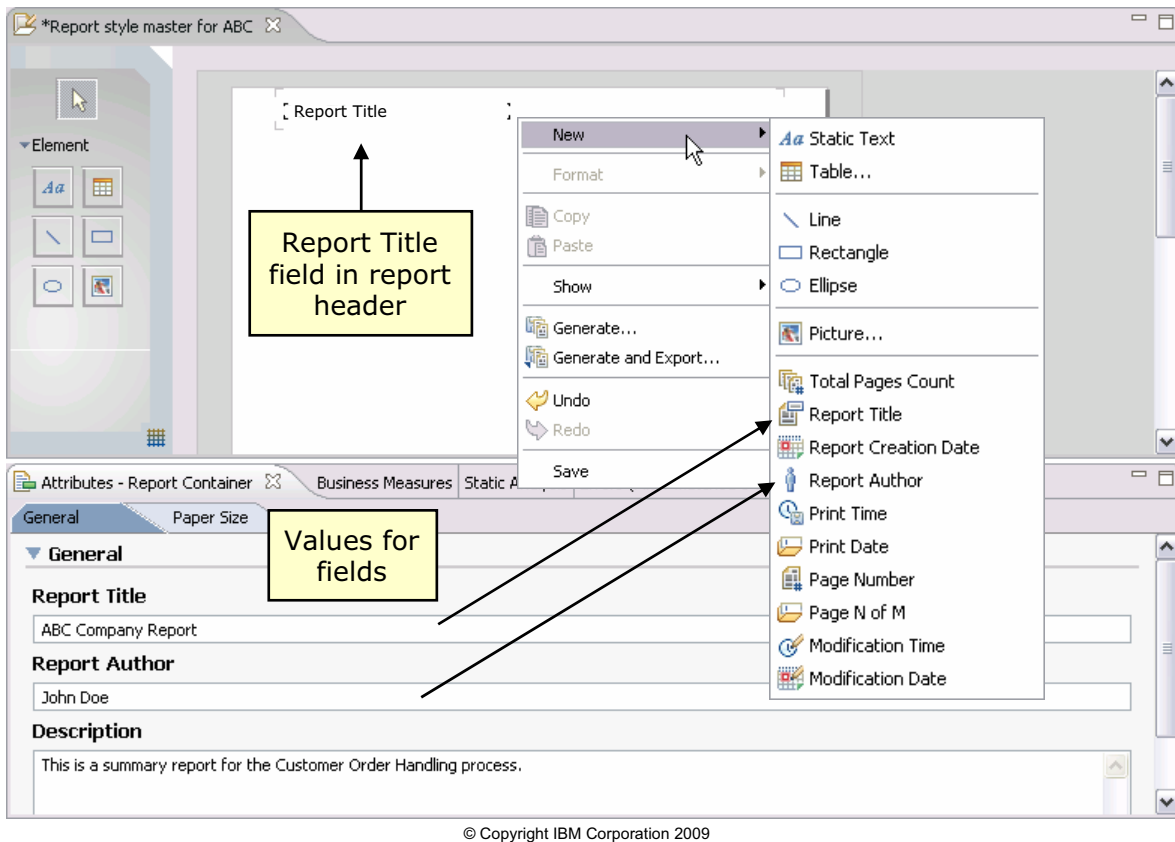


Figure 6-12. Report style master (2)

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

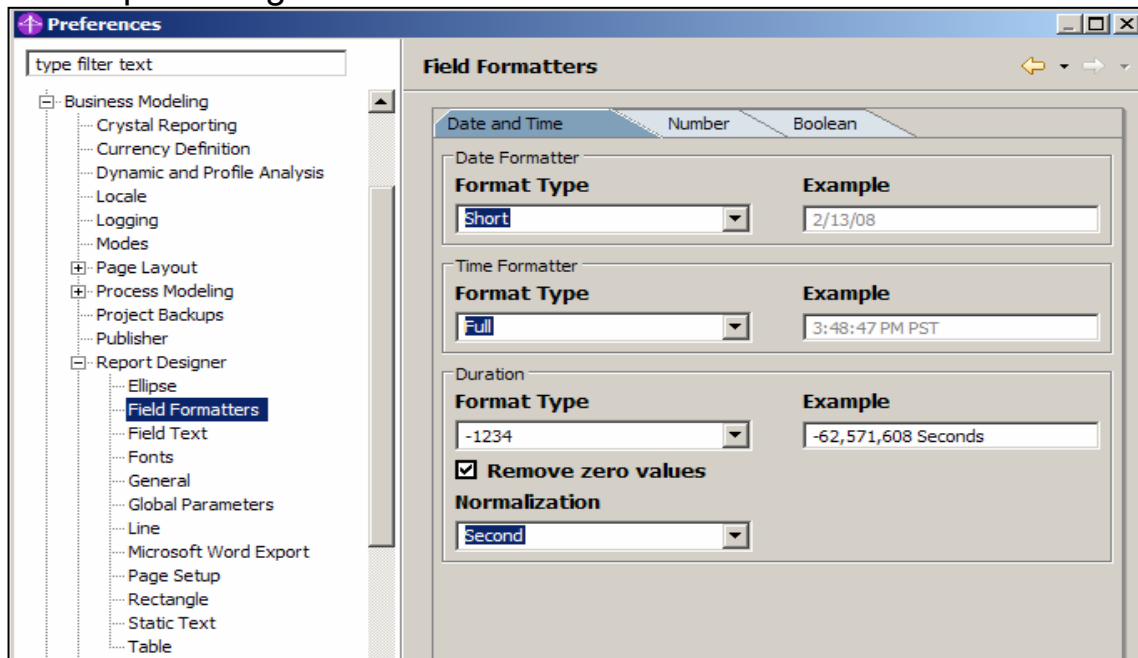
**Details —**

**Additional information —**

**Transition statement —** Next: Setting report designer preferences

## Setting report designer preferences

- Setting report preferences
  - Set various preferences to control the default format of elements in the report designer



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Figure 6-13. Setting report designer preferences

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Queries

## Queries

---

- Queries extract and show information on elements of a model.
  - Queries return information about model elements of one specified type.
- Use queries to:
  - Confirm that the content of your models accurately represents your business.
  - Gather required information for making business decisions.
  - Document and disseminate specific types of information.
  - Define the content used for creating reports.
- Query builder is used to create queries.
  - Expressions can be used to get information on specific model elements.
    - For example, create a query that retrieves all the individual resources that have a cost per time unit of \$20.00 or less.

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Figure 6-14. Queries

WB286 / VB2861.0

### **Notes:**



***Instructor notes:***

**Purpose —**

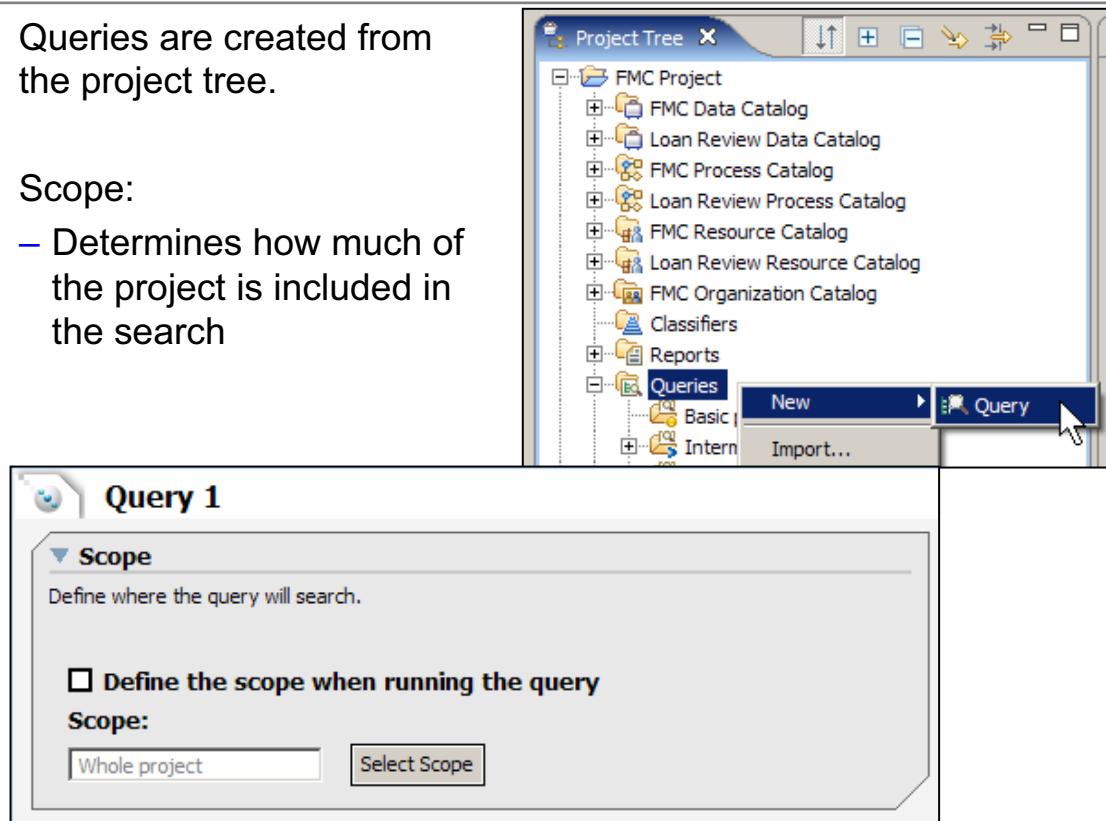
**Details —**

**Additional information —**

**Transition statement —** Next: Creating queries: scope

## Creating queries: scope

- Queries are created from the project tree.
- Scope:
  - Determines how much of the project is included in the search



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Figure 6-15. Creating queries: scope

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

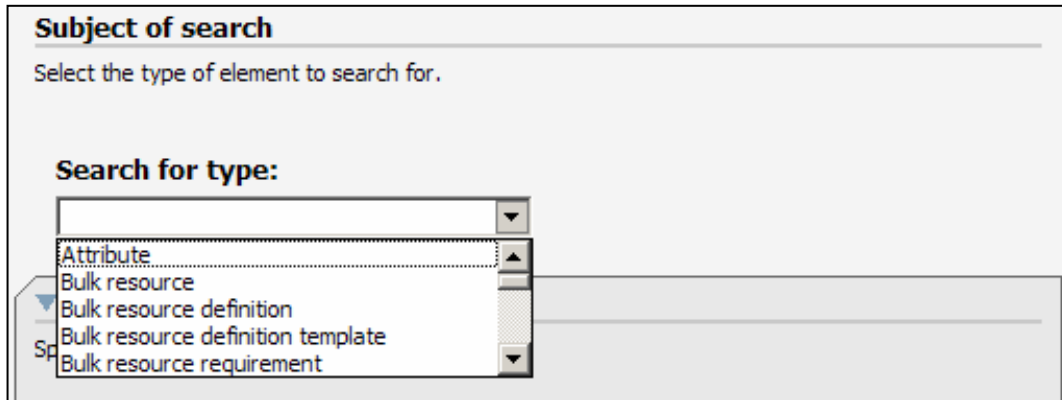
**Additional information —**

**Transition statement —** Next: Creating queries: subject of search

## Creating queries: subject of search

---

- Subject of search
  - Determines which element type to search for



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Figure 6-16. Creating queries: subject of search

WB286 / VB2861.0

### Notes:

***Instructor notes:***

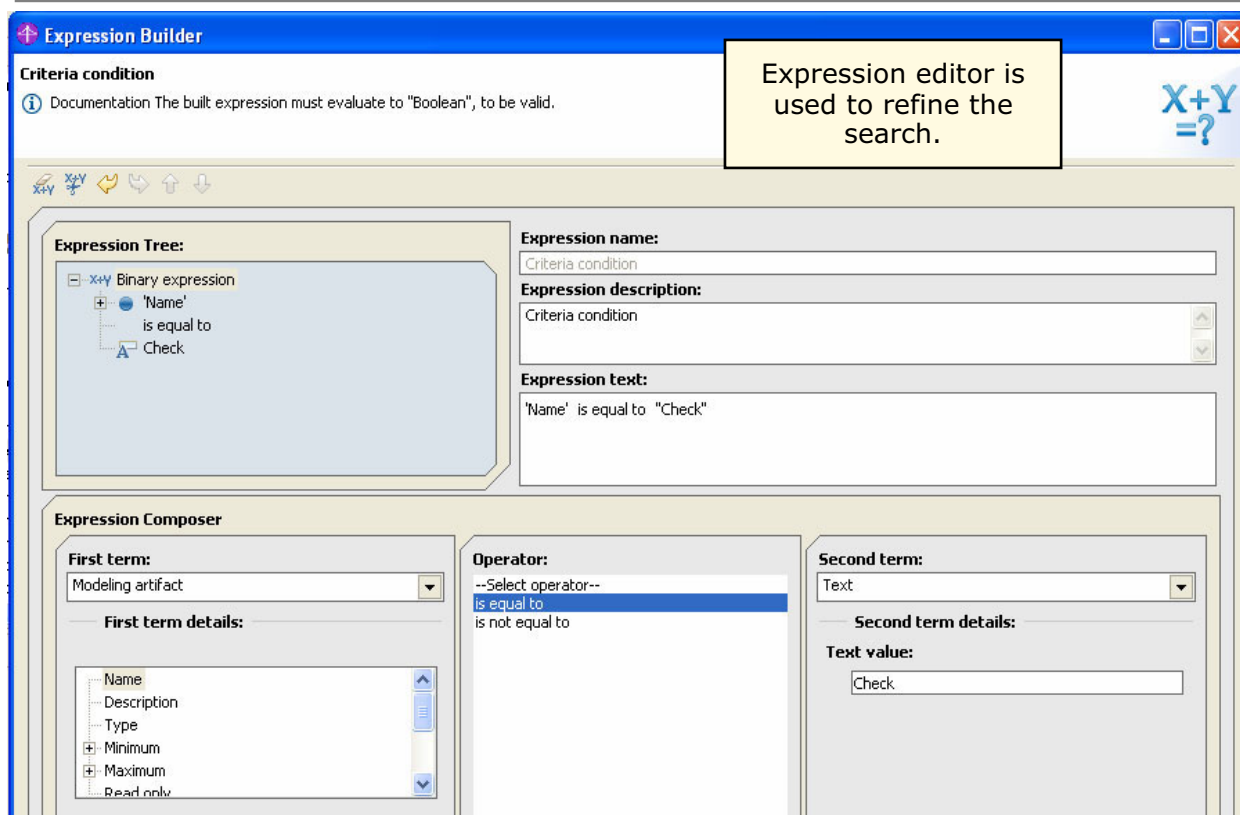
**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Creating queries: expression builder

## Creating queries: expression builder



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Figure 6-17. Creating queries: expression builder

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

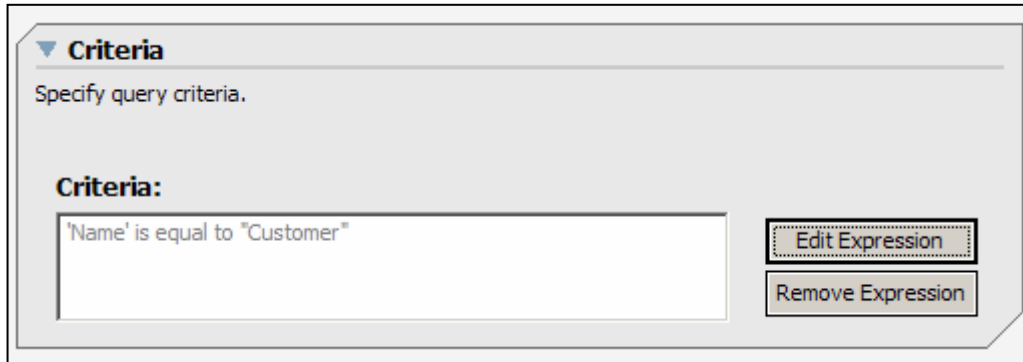
**Additional information —**

**Transition statement —** Next: Creating queries: define criteria

## Creating queries: define criteria

---

- Criteria
  - An expression to search for something more specific



▼ **Criteria**

Specify query criteria.

**Criteria:**

"Name" is equal to "Customer"

Edit Expression

Remove Expression

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Figure 6-18. Creating queries: define criteria

WB286 / VB2861.0

### **Notes:**



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Creating queries: result definition

## Creating queries: result definition

- Result definition
  - Defines what will be displayed

**Results definition**

Define the information to display for the type when you run this query.

☒ **Query results definition**

Name	Expression	
name	"State.Name" is not equal to "spaces"	

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Figure 6-19. Creating queries: result definition

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

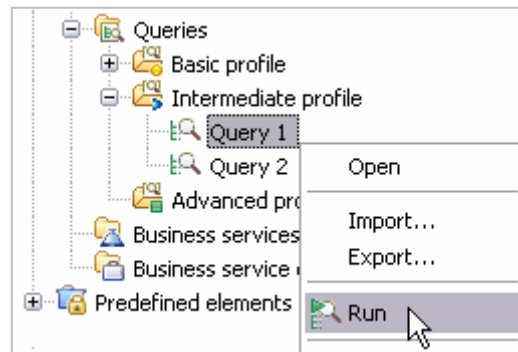
**Details —**

**Additional information —**

**Transition statement —** Next: Running the query

## Running the query

- Run from the Project Tree.
- If the query scope is defined at execution time, the query will prompt you to select a scope.
- The query view displays the query results.



Attributes - Report Page

Simulation Control Panel

Errors (Filter matched 0 of 1 items)

Query View

Query View 4:11:26 PM PST

Process Statistics 4:11 PM

Process Name	Catalog	Global Tasks	Local Tasks	Global Processes	Local Processes	Local Repositories	Global Services	Decisions
Customer Order Han...	Processes	2	8	2	0	0	0	4
Order Verification	Processes	1	2	0	0	0	1	0
Payment Handling	Processes	0	4	0	0	0	0	1

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Figure 6-20. Running the query

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Using queries in reports

## Using queries in reports

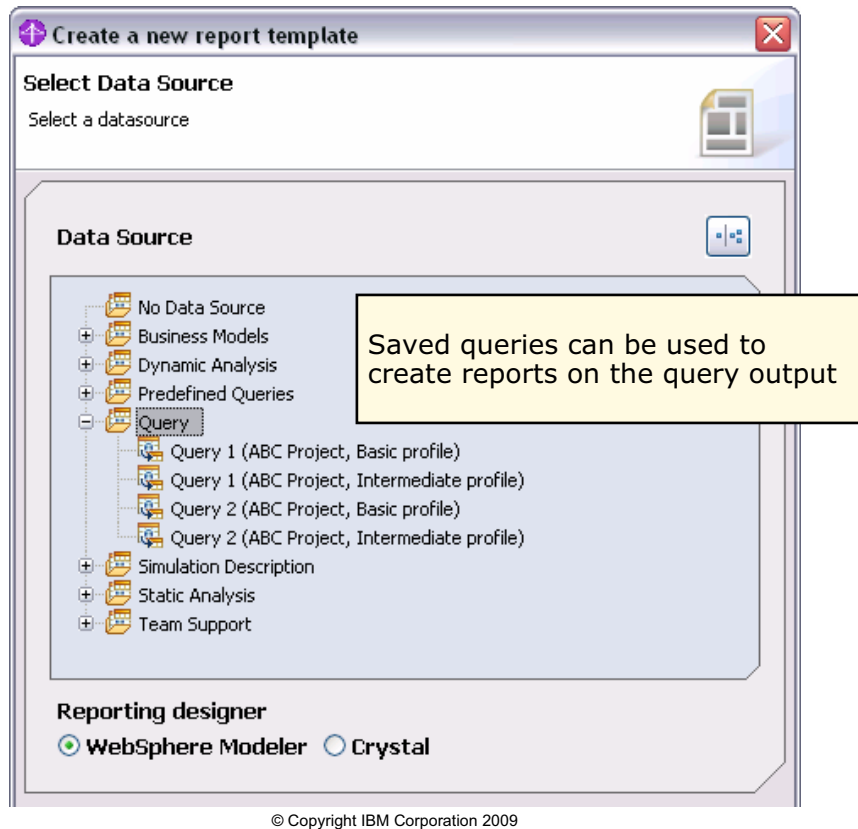


Figure 6-21. Using queries in reports

WB286 / VB2861.0

### Notes:

***Instructor notes:*****Purpose —**

**Details —** When defining reports in query, make sure it is meaningful to your project to avoid wasting time on figuring out what the report says.

**Additional information —**

**Transition statement —** Next: Exporting reports

## Exporting reports

- Exporting reports allows for the use of the information contained in your models for a variety of purposes.
  - Export documentation reports
  - Export reports that show the results of any type of analysis you run on a model or on simulation results
  - Export reports that show the version history of model elements.
  - Export custom reports based on report templates that were created in the report designer
- Changing text size in generated reports:
  - If the text in a generated report is too large or too small to be useful, it can be changed.

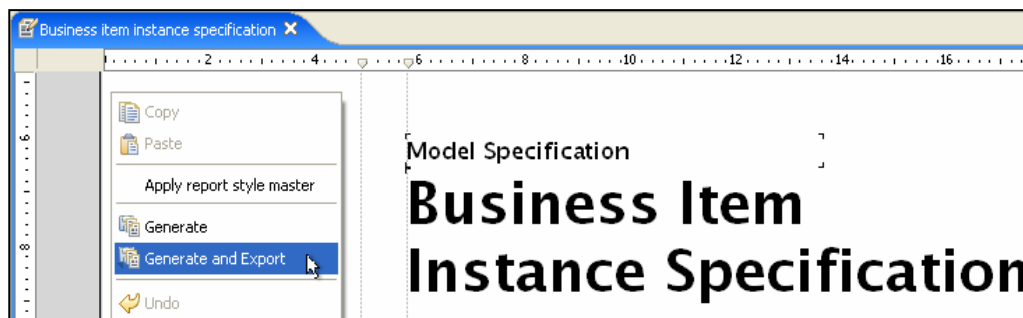


Figure 6-22. Exporting reports

WB286 / VB2861.0

### Notes:



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Exporting analysis data

## Exporting analysis data

- Export from the analysis view
  - Data exported depend on the type of analysis displayed.

The screenshot shows a table titled "Process Cases Summary | Simulation result Wednesday, January 31, 2007 12:52:13". The table has five columns: Case Name, Activity Name, Average Cost, Average Revenue, and Average Run Cost. A context menu is open over the table, showing options: Rerun, Select Columns, Refresh, Export All to Offset Delimited Text, Export All to Delimited Text, Export View to Delimited Text, and Export All to XML. The table data is as follows:

Case Name	Activity Name	Average Cost	Average Revenue	Average Run Cost
Case 1		USD3.00	USD0.00	USD3.00
	Process 1	USD3.00	USD0.00	USD3.00
	Task	USD0.00	USD0.00	USD0.00
	Task:2	USD1.00	USD0.00	USD1.00
	Task:3	USD0.00	USD0.00	USD0.00
All Cases		USD3.00	USD0.00	USD3.00

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Figure 6-23. Exporting analysis data

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Crystal Reports

## Crystal Reports

---

- WebSphere Business Modeler also provides support for Crystal Reports to facilitate the work of organizations that already use this application.
  - Crystal Reports is a separate product from WebSphere Business Modeler.
- Activities related to Crystal Reports:
  - Create new report templates in the Project Tree view, define their content using WebSphere Business Modeler data sources, and start the Crystal Reports design environment to specify the particulars of the report template
  - Copy, rename, and delete report templates
  - Generate and export reports based on existing report templates from the Project Tree view (assuming that Crystal Reports is installed on the local machine)
  - View and print generated reports
  - Import report templates that have been defined by another user
  - Export report templates for use or customization by another user
  - Check in and check out CVS versions of report templates
- WebSphere Business Modeler does not provide any predefined Crystal Reports templates.

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Figure 6-24. Crystal Reports

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### **Notes:**

WebSphere Business Modeler does not provide any predefined Crystal Reports templates. If you want to use the predefined report templates, you can generate and export them directly from the Project Tree view without using Crystal Reports.

***Instructor notes:*****Purpose —**

**Details —** Modeler provides Report Designer as a tool to create and generate reports. However, WebSphere Business Modeler also provides support for Crystal Reports, to facilitate the work of organizations that already use this application. Crystal Reports is a separate product from WebSphere Business Modeler. Therefore, you must purchase Crystal Reports separately to use it.

**Additional information —**

**Transition statement —** Next: Checkpoint

## Checkpoint

---

1. Name some of the categories of data sources used in WebSphere Business Modeler reports?  
\_\_\_\_\_
2. Which data source would contain information in a repository location of a version control system?  
\_\_\_\_\_
3. What is the function of the report style master?  
\_\_\_\_\_
4. What is the purpose of a scope when creating a query?  
\_\_\_\_\_

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Figure 6-25. Checkpoint

WB286 / VB2861.0

### **Notes:**

Write your answers here:

- 1.
- 2.
- 3.
- 4.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Unit summary

## Unit summary

---

Having completed this unit, you should be able to:

- Explain the process of creating custom reports
- Create report templates using data sources
- Export reports
- Use predefined and custom queries

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Figure 6-26. Unit summary

WB286 / VB2861.0

### **Notes:**



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint solution

## Checkpoint solution

---

1. Name some of the categories of data sources used in WebSphere Business Modeler reports?  
Business models, dynamic analysis, predefined queries, query (user-defined), simulation description, static analysis, team support
2. Which data source would contain information in a repository location of a version control system?  
Team support data sources
3. What is the function of the report style master?  
The report style master enables you to reuse header and footer information for multiple report templates
4. What is the purpose of a scope when creating a query?  
The scope determines how much of the project is to be included in the search

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Figure 6-27. Checkpoint solution

WB286 / VB2861.0

### Notes:

:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Exercise overview

## Exercise overview

---

In this exercise you will:

- Create a report style master
- Create a report template
- Add report details
- Add a report chart
- Apply a report style master to report

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Figure 6-28. Exercise overview

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —**



# Unit 7. Defining business measures

## Estimated time

00:45

## What this unit is about

This unit describes business measures.

## What you should be able to do

After completing this unit, you should be able to:

- Describe the purpose of WebSphere Business Monitor
- Describe the various WebSphere Business Monitor dashboards
- Define business measures and model elements
- Describe the capabilities of the Business Measures view in WebSphere Business Modeler

## How you will check your progress

- Checkpoint
- Lab exercises

## References

None

## Unit objectives

---

After completing this unit, you should be able to:

- Describe the purpose of WebSphere Business Monitor
- Describe the various WebSphere Business Monitor dashboards
- Define business measures and model elements
- Describe the capabilities of the Business Measures view in WebSphere Business Modeler

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Figure 7-1. Unit objectives

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### **Notes:**



***Instructor notes:***

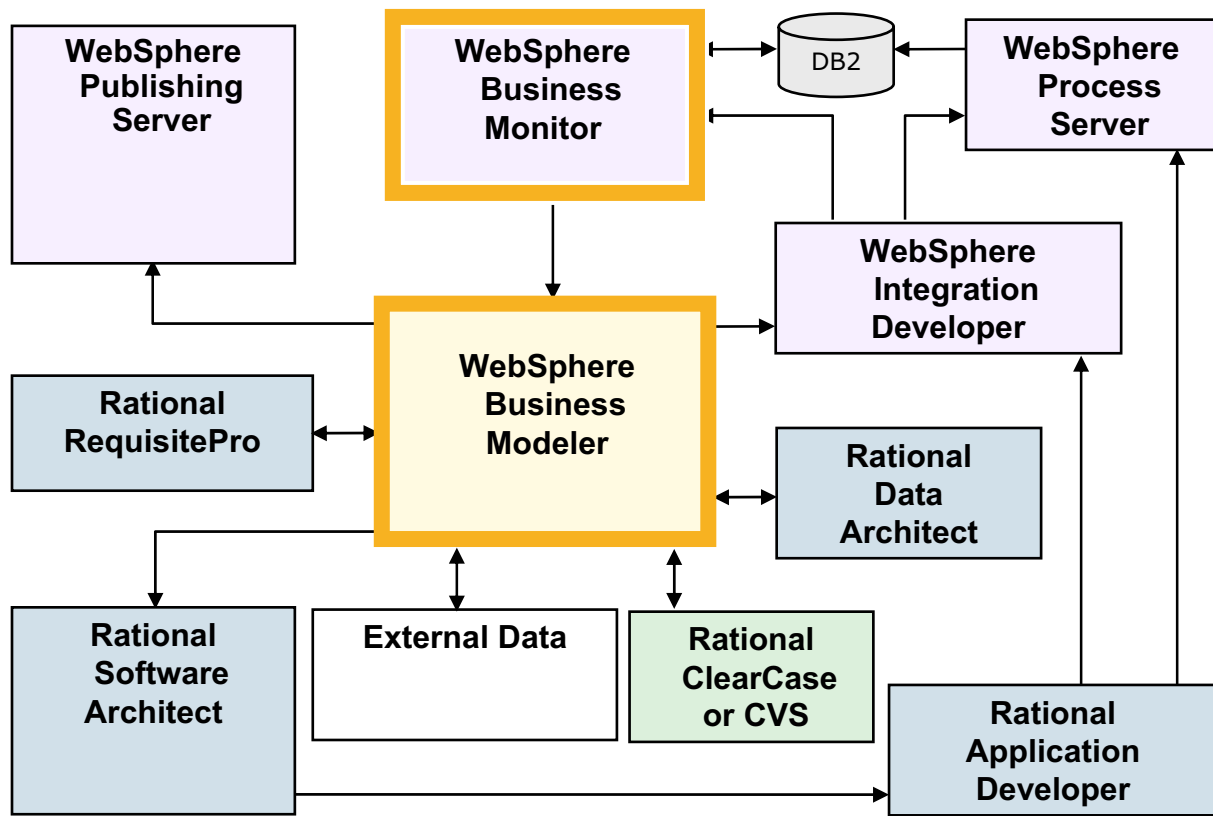
**Purpose** — To introduce the content of this unit.

**Details** —

**Additional information** —

**Transition statement** — Next: Creating business measures in WebSphere Business Modeler

# Creating business measures in WebSphere Business Modeler



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Figure 7-2. Creating business measures in WebSphere Business Modeler

WB286 / VB2861.0

## Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Why measure business performance?

## Why measure business performance?

---

- Monitor and control business operations
- Drive improvement of process efficiency
- Maximize the effectiveness of the improvement effort
- Achieve organizational goals and objectives

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Figure 7-3. Why measure business performance?

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: WebSphere Business Monitor overview

# WebSphere Business Monitor overview

- Captures business-related data
- Displays the measurement values on your dashboard
- Provides business intelligence insight through dimensional analysis and reporting
- Enables you to define actions to take when specified situations occur
- Identifies and notifies you of operation failures for inspection and analysis

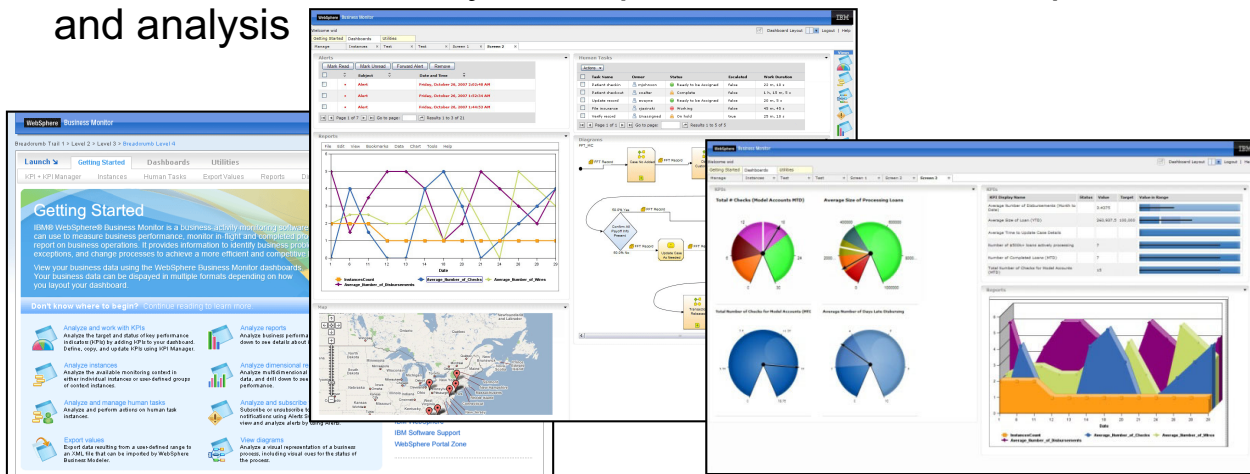


Figure 7-4. WebSphere Business Monitor overview

WB286 / VB2861.0

## Notes:

IBM WebSphere Business Monitor is business-activity monitoring software that measures business performance, monitors real-time and completed processes, and reports on business operations. It provides information that helps you to identify business problems, correct exceptions, and change processes to increase business competitiveness by improving process efficiencies.

WebSphere Business Monitor monitors business activities rather than IT events. For example, you can monitor the percentage of approved loans or the amount of profit a product produced this quarter rather than monitoring system response time and service throughput.

WebSphere Business Monitor is part of the IBM WebSphere Business Process Management product suite. Using the product suite, you can model your business processes with WebSphere Business Modeler, run the business process applications on WebSphere Process Server, and monitor the business process with WebSphere Business Monitor. To improve your business processes, WebSphere Business Monitor produces data that can be analyzed with the simulation functions of WebSphere Business Modeler.

For increased flexibility, you can use WebSphere Business Monitor to monitor business activities that have not been modeled using WebSphere Business Modeler. WebSphere Business Monitor is not only able to monitor business process applications running on WebSphere Application Server, WebSphere Process Server, and WebSphere Enterprise Service Bus, it can also monitor business process applications running on WebSphere MQ Workflow and FileNet Business Process Manager, virtually anywhere, if Common Base Events can be generated from their activity.

Use WebSphere Business Monitor to view business metrics and key performance indicators (KPIs). Users interact with Web-based dashboards pages to view current operations as well as previously stored metrics. With the Web-based interface, you can create dashboard pages, add data to the pages, and configure the data to be displayed.

To monitor activities or processes, WebSphere Business Monitor server receives and processes events from business applications. The WebSphere Business Monitor server can subscribe to business events from various sources including WebSphere Process Server and other applications in the business environment. The events that WebSphere Business Monitor server receives reflect your business activity. Information processed from events is stored in the Business Monitor database. Additionally, you can configure the WebSphere Business Monitor server to detect special business situations and manage the resulting actions.

***Instructor notes:***

**Purpose —**

**Details —**

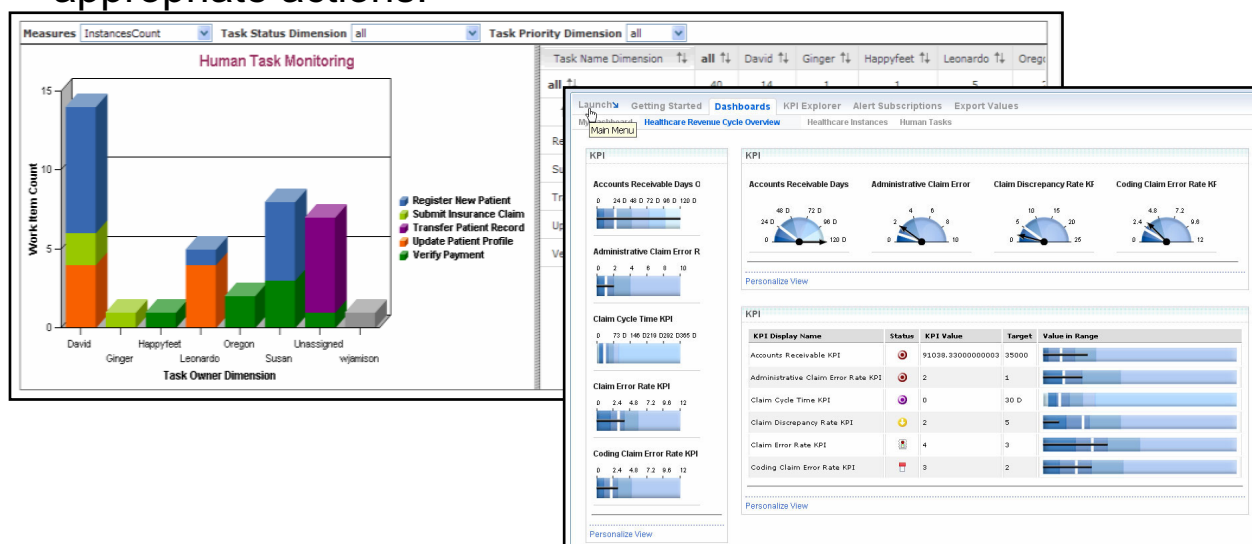
**Additional information —**

**Transition statement —** Next: WebSphere Business Monitor dashboards



## WebSphere Business Monitor dashboards

- Business performance-management dashboards are used to view the financial and operational data of a business.
- The dashboards operate in a near-real-time environment to monitor business situations, allowing users to manage the appropriate actions.



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Figure 7-5. WebSphere Business Monitor dashboards

WB286 / VB2861.0

### Notes:

***Instructor notes:***

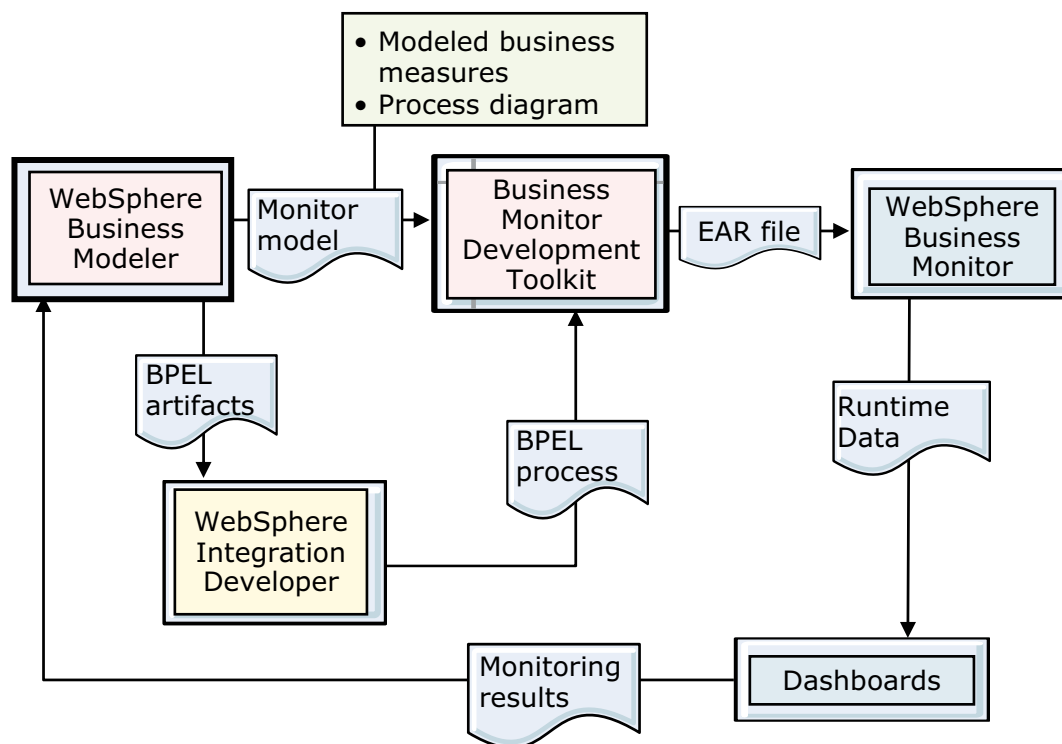
**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Life cycle of performance measurement

## Life cycle of performance measurement



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Figure 7-6. Life cycle of performance measurement

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### Notes:

The WebSphere Business Monitor development toolkit provides technical users with an environment for creating and testing monitor models. Monitor models describe how events should be processed and how information should be collected for use with dashboards.

After modeling the process, a business analyst adds business measures in WebSphere Business Modeler. First, the analyst evaluates the process and the business objectives to determine which business measures will be needed from the executing process. Business measures information that can be specified in WebSphere Business Modeler is separated into two types:

- Information to be used for dashboard display and analysis (specified in the Business Performance Indicators tab).
- Information to collect from running process instances (specified in the Monitored Values tab). This information can be used to improve the accuracy of simulations in WebSphere Business Modeler.

The monitor model that is created during this phase is used to provide guidance to the systems analyst who will complete the implementation of the monitor model in the WebSphere Business Monitor Development Toolkit.

### **Business process modeling**

Business process modeling in WebSphere Business Modeler provides the foundation. A business analyst performs the following tasks:

- Builds and refines the process model
- Simulates “What if?” conditions
- Selects the processes for monitoring

### **Specify business measures in WebSphere Business Modeler**

Starting with a process model in WebSphere Business Modeler, you can specify business measures for performance management.

- **Business Measures View:** The Business Measures view typically opens by default when you open a process, along with the Attributes view and the Errors view. You can use the Business Measures view to specify the business measures for the process and the monitored values to return to WebSphere Business Modeler.

### **Export monitor models**

You can export a preliminary monitor model from WebSphere Business Modeler to refine in the WebSphere Business Monitor Development Toolkit. After you can deploy to WebSphere Business Monitor. This monitor model provides guidance to the developer who will complete the model, and also includes Scalable Vector Graphics (SVG) diagrams for each process, sub process, and loop.

### **Implement monitor models**

Information is transferred from WebSphere Business Modeler to WebSphere Business Monitor in the form of a monitor model. A monitor model describes business measures (such as metrics and key performance indicators), their dependencies on incoming events, conditions (business situations) warranting business action, and outbound events that represent notifications of such conditions and might trigger business actions.

### **Import results**

Once a monitored process has been executing for some time, you can export the values captured by WebSphere Business Monitor to an XML file and import them into WebSphere Business Modeler for further analysis on the process.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: What is a business measure?

## What is a business measure?

---

- Business measures describe the performance management aspects of a business that are required for real-time business monitoring.
  - They include metrics and key performance indicators (KPIs).
- Process execution results are collected, calculated, and analyzed against business measures using WebSphere Business Monitor.
- Business measures can be used for:
  - Compliance or documentation
  - Redesign
  - Execution
- In a process model, specify the information that you want to monitor by associating business measures with the process.

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Figure 7-7. What is a business measure?

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### **Notes:**

#### **Compliance or documentation**

Documenting business processes can help businesses to understand them as well as providing documentation that can be used by staff or customers for training. Compliance regulations often have documentation requirements. Linking to real-time monitoring can provide a feedback mechanism for reporting the requirements needed for compliance.

#### **Redesign**

Documenting both the current state and future state business process allows for comparisons. Monitoring can help with Return on Investment (ROI) analysis.

#### **Execution**

If the future state business process has runtime characteristics associated with it, the monitor model can be passed to application, workflow, and business process development tools.

***Instructor notes:***

**Purpose —**

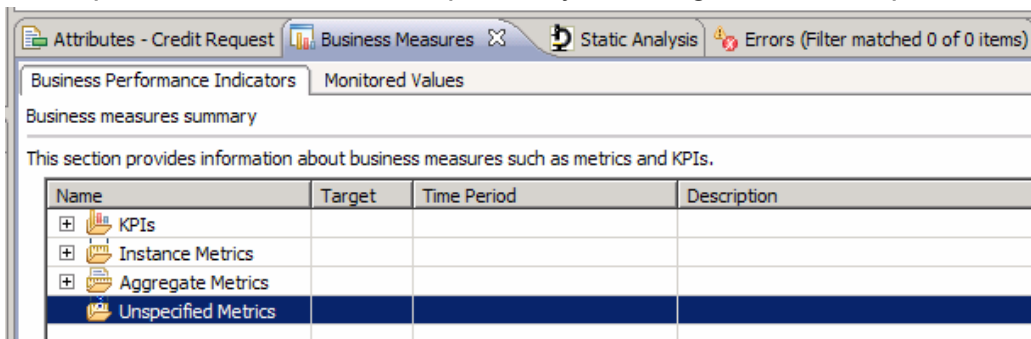
**Details —**

**Additional information —**

**Transition statement —** Next: Business measures in WebSphere Business Modeler

## Business measures in WebSphere Business Modeler

- Business measures in WebSphere Business Modeler provide a way for business analysts to specify what should be monitored when the business process is executing.
  - The business analyst has insight into key elements of the business process that could indicate the success or failure of strategic business goals.
- Business measures can be associated with process elements.
- Predefined and custom business measures can be built.
- The business analyst's specification of what should be monitored is exported to the WebSphere Business Monitor Development Toolkit.
  - The implementation is then completed by the integration developer.



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Figure 7-8. Business measures in WebSphere Business Modeler

WB286 / VB2861.0

### Notes:

WebSphere Business Modeler provides a set of business measure templates for commonly monitored business measures.



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Monitor model (1)

## Monitor model (1)

---

- Describes business measures such as metrics and key performance indicators (KPIs).
- Specifically describes how to:
  - Gather information from real-time (inbound) events
  - Aggregate information to calculate higher-level business metrics or key performance indicators (KPIs)
  - Represent the calculated values on a number of dashboard views and analysis reports, based on the business needs
  - Recognize business situations
  - Emit situation events that may be used to trigger actions

---

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Figure 7-9. Monitor model (1)

WB286 / VB2861.0

### **Notes:**

The monitor model is the container of definitions and specification on what and how information is monitored against a process.

Modeler contains a lightweight, Business Analyst-friendly Business Measure Details designer that provides the relevant options for a business user.

The information gathered in this input window is played forward toward the Monitor environment in the form of a Monitor Model.

The Monitor model describes business measures (such as metrics and KPIs), the dependencies on incoming events, conditions (business situations) warranting business action, and outbound events that report specified conditions and warrant an action.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Monitor model (2)

## Monitor model (2)

---

- Specifications are defined in WebSphere Business Modeler's business measures view.
  - Has integrated capability within the process editor
  - Allows users to quickly and easily define KPIs and metrics
  - Targeted at business users
- Technical implementation is performed with the Development Toolkit in WebSphere Integration Developer.

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Figure 7-10. Monitor model (2)

WB286 / VB2861.0

### **Notes:**

The monitor model can be exported from WebSphere Business Modeler and then completed in the WebSphere Business Monitor Development Toolkit in WebSphere Integration Developer. The final monitor model (completed in the Monitor Development Toolkit in WebSphere Integration Developer) defines these actions so they can execute in a runtime environment (WebSphere Business Monitor).

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Basic monitor model elements

## Basic monitor model elements

---

- Metric
  - Represents the value of a monitored item and helps in assessing performance in a particular business area
    - Example: Order processing time
  - Can have numeric values such as the number of items shipped, or non-numeric values such as the delivery dates of shipments
- Key performance indicator (KPI)
  - A quantifiable measure designed to track critical success factors of a business process
  - Example: Orders must be processed within three days  
(Order processing time < 3 days)

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Figure 7-11. Basic monitor model elements

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Metric

## Metric

---

- A holder for information, usually a business performance measurement, in a monitoring context
- Associated with one or more maps that, when evaluated, give the metric a value
- Can be used alone or in combination with other metrics to define the calculation for a key performance indicator (KPI), which measures performance against a business objective
- Examples of metrics:
  - Working duration of a process
  - Name of the user assigned to a task
  - Supplier's response time
  - Cost of the risk assessment step in an insurance process
- Two types
  - **Instance metrics** return the result from one run of the process.
  - **Aggregate metrics** are calculated across multiple runs of the process, for finding the average, maximum, minimum, or total number of occurrences.

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Figure 7-12. Metric

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### Notes:

A metric is a measurement of an aspect of a process or process element that is used to assess business performance. A metric can be used alone or in combination with other metrics to define the calculation for a key performance indicator (KPI), which measures performance against a business objective. A metric is defined within a specific process using WebSphere Business Modeler, and the value of that metric is captured and evaluated using WebSphere Business Monitor.

As an example of an instance metric, you can measure the order cost for each run (each instance) of an order handling process. Typically, each time the order handling process runs, it produces a different result. For example, for three instances of the process, the order costs could look like this:

InstanceOrder cost

1100

2150

3125



Alternatively, you can monitor the process as a whole by applying aggregations over its process instances. For example, if there are three instances of the process with the order costs shown above, you can check the order cost across all instances of the process and calculate the average as follows: (Instance 1 + Instance 2 + Instance 3) / 3 = 125

Aggregate metrics usually use instance metrics and apply a function (maximum, minimum, average, or total) to get a useful result. If you created a Revenue Minus Cost metric, you could have an Average Revenue Minus Cost aggregate metric to hold the average number across multiple runs of the process.

As another example, you may have a Shipping Duration metric that performs a calculation to subtract a Shipping Date metric from an Order Date metric, providing you with the shipping duration for each invoice. To find the average shipping duration across all invoices, you would create an aggregate metric, select “Average” for the aggregation function, and select “Shipping Duration” for the aggregation source. This Average Shipping Duration aggregate metric could be used, in turn, to create a KPI called “Average Shipping Duration < 5 days.”

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Key performance indicator (KPI)

## Key performance indicator (KPI)

---

- KPIs are detailed specifications required to track business objectives.
  - Used in measuring business performance
- Each KPI is associated with a specific process, and is quantifiable, measurable, and results-oriented.
- Two ways of specifying expected values or ranges:
  - Target value with percentage deviation margins
  - Upper and Lower Limits

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Figure 7-13. Key performance indicator (KPI)

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### Notes:

A key performance indicator (KPI) is a type of metric that indicates the degree of business performance.

KPIs are created based on business objectives. A business objective is an executive statement of direction in support of a corporate strategy. The business objective is a high-level goal that is quantifiable, measurable, and results-oriented. For business measures modeling, the business objective is translated into a KPI that enables the organization to measure some aspect of the process against a target that they define. Within WebSphere Business Monitor, the KPI is compared against actual results to determine the level of success.

A KPI is associated with a specific process and is generally represented by a numeric value. A KPI may have a target and allowable margins, or lower and upper limits, forming a range of performance that the process should achieve. A KPI can be thought of as a metric with a target. An example of a simple KPI is: Average time for response to a customer inquiry is less than two days.

As more detailed example, say that an organization sets the following business objectives:

Orders must be processed within three days compared to the current average of five days

Average amount of an order must increase by 10%

To determine if their new process is helping the organization to achieve its business objectives, the business analyst sets and monitors the following KPIs:

- Shipment duration KPI. For the Delivery process, track the order date against the delivery date and monitor when the average time to shipment is within a 20% range of the five days target
- Manual order approval KPI: For the Order Handling process, track the approval durations for manual orders and monitor when maximum approval time exceeds one business day
- Average order amount KPI: For the Customer Order process, track the average amount of each order

KPIs can be made up of one or more metrics. The calculated results of the metrics during process monitoring are used to determine whether the target of the KPI has been met. For example, tracking the average time to shipment might include the following metrics:

- Elapsed time for order completion
- Elapsed time for order approval
- Number of orders received
- Working duration of each task in the process
- Percentage of orders automatically approved

Determining which KPIs are useful, based on the business objectives, is one of the most important tasks involved in the design of effective business dashboards.

Each KPI can have an associated target with margins, or lower and upper limits. The limits and margins indicate a range that the KPI should remain within. What you see in the business dashboards is affected by how you specify the KPIs in WebSphere Business Modeler. You can also add situation events that can be generated when specific conditions are met, and these in turn can trigger business actions.

These are your options for specifying a KPI:

- Specify an exact target and acceptable target variations (defined by lower margin and upper margin), using percentages below and above the target as the margins.
- Specify a safe range (defined by lower limit and upper limit), using specific numeric values as the limits.

For example, if you wanted to specify a lower limit of 40 minutes and an upper limit of 75 minutes, you could do it in either of the following two ways, depending on how you wanted to specify a range or target:

- Using specific numeric values as a safe range:
  - Lower limit: 40 minutes

- Upper limit: 75 minutes
- Using a target and percentages:
  - Exact target: 50 minutes
  - Lower margin: 20% [  $(50 \text{ minutes} - (50 \text{ minutes} * .20)) = 40 \text{ minutes}$  ]
  - Upper margin: 50% [  $(50 \text{ minutes} + (50 \text{ minutes} * .50)) = 75 \text{ minutes}$  ]

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Dimensions

## Dimensions

---

- Data categories used to organize information for reporting and analysis.
- Process data can be described in terms of:
  - Quantitative data (what is measured or counted)
    - Example: order price, number of sales, shipping time
  - Dimensions (how to divide up, or group the data)
    - Example: customer, address, product
- Dimensions provide a structure that summarizes business measures.
- WebSphere Business Monitor dashboards allow the user to graphically display and interactively analyze this data.

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Figure 7-14. Dimensions

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### Notes:

A *dimension* is a data category that is used to organize and select instances for reporting and analysis. For example, a retail business performance might be analyzed by time, products, and stores; for this business, time, products, and stores are dimensions. Each of the dimensions has one or more levels that define the overall hierarchy of the dimension. For example, the time dimension might have year, month, and day levels.

Assume that you have collected data, for example, sales figures for every product your company makes. You then need to retrieve information from this data, and answer the following questions:

- What are the total sales for each product by store?
- Which products are selling best over time?
- Who is your highest-performing salesperson?

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Dimension levels



## Dimension levels

- Dimensions can (optionally) have multiple levels.
- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"> <li>• Location           <ul style="list-style-type: none"> <li>– Continent               <ul style="list-style-type: none"> <li>• Country                   <ul style="list-style-type: none"> <li>– State/Province                       <ul style="list-style-type: none"> <li>&gt; City</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Time           <ul style="list-style-type: none"> <li>– Century               <ul style="list-style-type: none"> <li>• Year                   <ul style="list-style-type: none"> <li>– Month                       <ul style="list-style-type: none"> <li>&gt; Day</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Product           <ul style="list-style-type: none"> <li>– Category               <ul style="list-style-type: none"> <li>• Name</li> </ul> </li> </ul> </li> </ul> |
|---|--|---|

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Figure 7-15. Dimension levels

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### Notes:

Consider the following simple Location dimension hierarchy as an example:

- Country
- State/Province
- City

Country is at a higher level than State/Province, which in turn is at a higher level than City.

The Location dimension has levels called Country, State/Province, and City

- Each level enables you to aggregate the levels that are underneath it
- For example at the Country level, you might have the total of all data for all states. Or at the State level, you might have the total of all data for all cities

In the Business Measures editor, you create dimensions and then define aggregation group levels as metrics within those dimensions

- Using the previous example, you would first create a Location dimension

- Within the Location dimension, you would create a Country metric with an aggregation group level of 0, a State metric with a level of 1, and a City metric with a level of 2

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Dimensional analysis

## Dimensional analysis

---

- Provides business insight by summarizing business metrics.
- Organizes data into levels of detail that can be drilled down to extract significant information.
- Dimensional analysis enables a breakdown of quantitative measures by some grouping (dimension).
  - Typically follows this format: “function” of a “measure” by a “dimension”
    - Examples:
      - > Average of Profit by City
      - > Total of Order Value by Customer
      - > Maximum of Employee Salary by Time

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Figure 7-16. Dimensional analysis

WB286 / VB2861.0

### Notes:

- Each process can be described in terms of quantitative data, which takes on many values and participates in calculations, and in terms of dimensions, which are entry points for manipulating and analyzing the data in meaningful ways
- In dimensional analysis, quantitative data is what you add up (such as order quantity, cost of order), and dimensions are how you divide your data (such as time, customer, location, product)
- Generally, any measure with non-numeric values is a level of a dimension, and you analyze other measures against dimensions

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Predefined business measure templates (1)

## Predefined business measure templates (1)

---

- Templates provide definitions of frequently-used business measures.
- Used with instance metrics.
  - Tracks information over a single run of the process
- Templates can be applied to business measures created on top-level processes, tasks, loops, and subprocesses.

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Figure 7-17. Predefined business measure templates (1)

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### **Notes:**

You can create business measures based on a set of predefined business measure templates. The templates are designed to help you create business measures that are frequently required. For example, you can add a business measure to track the working duration of a task or whether a process is delayed. You can also add a business measure to access the data carried through the process by a business item.

Business measures based on a template are always instance metrics. They track information over a single run of the process.

The name of the business measure is based on the element (top-level process, task, loop, or local subprocess) and the template that you select. For example, if you right-click the Order Received task and create a business measure based on the State template, the business measure is called Order Received State. If you create a business measure based on an Order business item and the Business Item Input template, the business measure is called Order Business Item Input.

If you create a business measure based on a business item input or output, you also select the business item attribute that you want to track. For example, you might have an attribute

that holds the total amount of an order, the number of items in an order, or the customer rating. You might want to change the name based on the attribute that you want to track, for example Order Amount rather than Order Business Item Input.

Templates can be applied to business measures created on top-level processes, tasks, loops, and subprocesses.

***Instructor notes:***

**Purpose —**

**Details —**

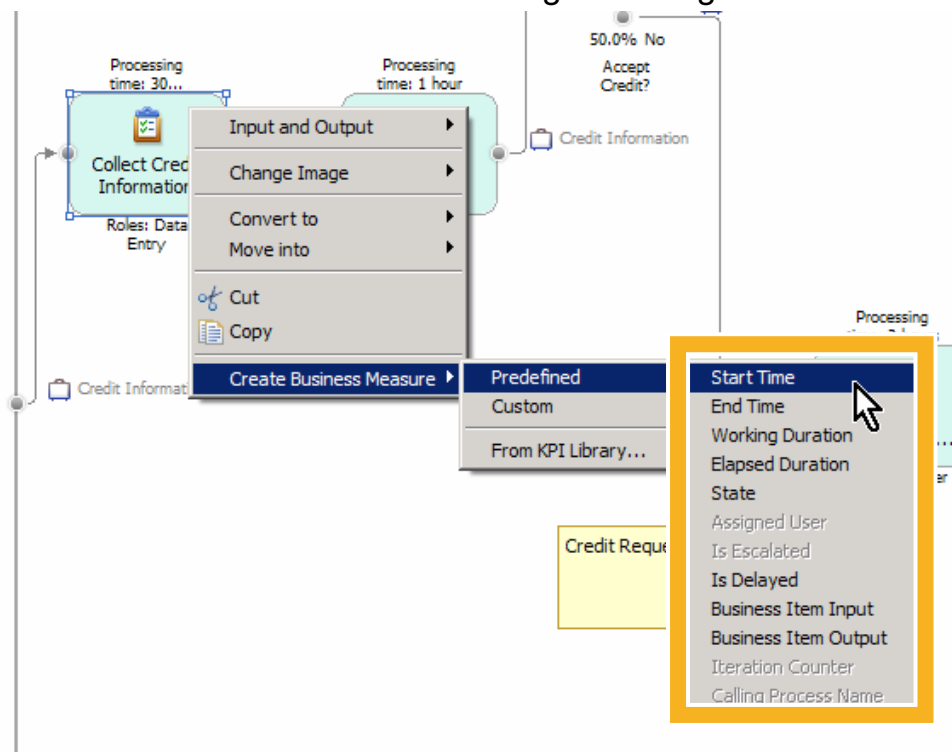
**Additional information —**

**Transition statement —** Next: Predefined business measure templates (2)



## Predefined business measure templates (2)

- Available from context menu when right-clicking model element or process.



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Figure 7-18. Predefined business measure templates (2)

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### Notes:

Predefined business measures templates make it easy to capture specific kinds of information, such as the working duration of a task or the value of a specific business item attribute.

You can create business measures directly from the Process editor by right-clicking an element (such as a task, loop, or local subprocess) whose performance you want to track or by right-clicking the background of the process diagram to specify a business measure for the top-level process. You can select an available template from the list of predefined templates or create a custom business measure.

The following predefined templates are provided:

**Table 1: Predefined Templates**

Name	Value Type	Description
Start time	Date Time	When the current run of the activity started
End time	Date Time	When the current run of the activity ended

**Table 1: Predefined Templates**

<b>Name</b>	<b>Value Type</b>	<b>Description</b>
Working duration	Duration	Lenght of time that the activity is actively running
Elapsed duration	Duration	Difference between the start time and end time of the activity, which might include idle time as well as processing time
State	Text	Current state of the activity
Assigned user	Text	Name of the user who claims the activity at run time (applicable only to human tasks)
Is escalated	Boolean	Whether a task escalation has taken place (applicable only to human tasks)
Is delayed	Boolean	Whether the activity is delayed
Business item input	Type of the selected business item attribute	Value of an attribute of a business item that is an input to the activity
Business item output	Type of the selected business item attribute	Value of an attribute of a business item that is an output from the activity
Iteration counter	Integer	Number of times a loop runs (applicable only to loops)
Calling process	Text	Name of the process that started this top-level process (applicable only to top-level process)

***Instructor notes:***

**Purpose** —

**Details** — See student notes.

**Additional information** —

**Transition statement** — Next: Predefined business measure templates (3)

## Predefined business measure templates (3)

Metrics based on some templates require a default value

**Business Measure Information**

Name: Credit Request Working Duration

Type: ☐ KPI ☒ Instance metric ☐ Aggregate metric ☐ Unspecified

Description: This metric measures the working duration of Credit Request.

Business Measure Details | Dashboard Samples

**Type and Default Value**

☐ Specify a default value and type

Type: Duration

Default value: Days: 0, Hours: 0, Minutes: 0, Seconds: 0, Milliseconds: 0

**Instance Metric Calculation Details**

Specify the method used to calculate this instance metric.

☒ Specify how to calculate this instance metric

☒ Using a predefined business measure template for a process element

Template: Working Duration

Process element: Credit Request

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Figure 7-19. Predefined business measure templates (3)

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### Notes:

After selecting a predefined business measure, the Business Measure Details designer displays.

In this example, a business measure based on the Working Duration template is being associated with the Review Order With Customer task. The name and description were filled in automatically. Remember that predefined business measures can only have the instance metric type.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Custom business measure: key performance indicator (1)

## Custom business measure: key performance indicator (1)

**Business Measure Information**

Name: RequestTime

Type: ☒ KPI ☐ Instance metric ☐ Aggregate metric ☐ Unspecified

Description: Time for a credit request to be processed

Business Measure Details | Dashboard Samples

Dashboards present continuously updated business measures data in a graphical format to make it easy to track process performance.

A KPI is calculated across multiple runs of the process and is used to track business objectives. Examples of KPIs and their targets are "Average time for response to a customer inquiry" with a target of "less than two days", "Achieve target profit" with a target of "\$65000," or "Reduce employee turnover" with a target of "5%". This type of data can be displayed in the following dashboards:

**KPI Table:** Displays details of modeled Key Performance Indicators (KPIs) such as KPI value relative to the defined ranges and the target, if applicable, and the status.

**KPI Gauge:** Displays an individual KPI value, relative to the KPI range and target in a full or half gauge format, if applicable.

**Simple KPI:** Displays a set of KPIs and shows the current value of each KPI relative to the target. The color reflects the current range color.

**KPI Bar:** Displays an individual KPI value, relative to the KPI range and target in bar format, if applicable.

**Alerts:** Displays alerts that notify users of defined situations occurring at run time.

**KPI Table**

KPI Name	Status	Value	Target	Range
Orders	↑	90	50.0	<div style="width: 80%;"></div>
Minimum	↓	4.0	20.0	<div style="width: 20%;"></div>
Percentage	↓	3	55.0	<div style="width: 60%;"></div>
Total Order	↑	390.0	100.0	<div style="width: 90%;"></div>

Customize View

List of WebSphere Business Monitor dashboards that use KPIs

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Figure 7-20. Custom business measure: key performance indicator (1)

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### Notes:

7-48 Modeler V6.2: Process Simulation and Analysis

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***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Custom business measure: key performance indicator (2)

## Custom business measure: key performance indicator (2)

**▼ Target Type and Value**

The target is an exact value that the KPI should achieve.

☒ Specify a target type and value

Specify an exact value that the KPI should achieve (number or duration type)

Type: Duration

Target value:

Days	Hours	Minutes	Seconds	Milliseconds
3	0	0	0	0

**▼ Ranges**

☒ Specify range details:

Ranges can be defined as percentages of the target value or as fixed, actual values.

☐ Percentage of target value (target value = 100%)

☒ Actual value

Specify ranges

A range is a set of values, such as allowable margins or lower and upper limits, against which to track your KPI.

Specify a set of ranges against which to track the KPI

Range Name	Start Value	End Value
Low	1 Second	< 2 Days 0 Sec...
Expected	2 Days 0 Sec...	< 3 Days 0 Sec...
High	3 Days 0 Sec...	< 24 Days 0 Se...

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Figure 7-21. Custom business measure: key performance indicator (2)

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### Notes:

To specify an exact value that the KPI should achieve, click **Specify a target value and type**.

- Select a specific type for the KPI, either **Number** or **Duration**.
- Specify the **Target Value** for the KPI to achieve. If you selected **Number** as the type, you must type a number. If you selected **Duration** as the type, you must select some combination of days, hours, minutes, and seconds. If you did not select a type, the value is optional and can be any text.

To specify a range or set of ranges against which to track the KPI, click **Specify range details**.

To have the target value treated as 100% for setting the ranges, select **Percentage of target value**, or, if you have no target or want to specify exact ranges, select **Actual value**. For example, you might have an Acceptable range that is from 90% to 100% of the target and a Good range that is from 100% to 110% of the target. Or, using actual values, you



might have an Acceptable range that is from 5 to 10 and a Good range that is from 10 to 20.

To add a range, click **Add**. Click the **Range name** cell and type a more meaningful name. Type the start value and end value of the range. For example, if you are trying to achieve a target of 5, you might have a range of 1-4 called Poor, a range of 4-6 called Good, and a range of 6-10 called Excellent.

***Instructor notes:***

**Purpose —**

**Details —** Emphasize that all the options in this designer are optional (either select or clear the checkboxes).

**Additional information —**

**Transition statement —** Next: Custom business measure: key performance indicator (3)

## Custom business measure: key performance indicator (3)

**Time Period for Data Collection**

☒ Specify a time period over which the business measure will be monitored

☒ Repeating ☐ Rolling ☐ Fixed

Period type: Yearly

Last: 30 days

Time zone: GMT-8

Base period on: ☒ Last full period ☐ Period in progress

Start date:

End date:

Time zone: GMT-8

**Alerts**

You can specify instructions for notification when specific conditions occur. For example, when this measure exceeds a certain value, send an email.

☒ Specify when to send an alert and the action to take as a result

Alert Description
RequestTime Alert

Add

Restrict the set of information that will be used to calculate the value of the KPI at run time

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Figure 7-22. Custom business measure: key performance indicator (3)

WB286 / VB2861.0

### Notes:

To specify the time period for the KPI, click **Specify a time period over which the business measure will be monitored**.

To calculate the KPI based on data from a repeating time period, click **Repeating** and select daily, monthly, quarterly, or yearly. Select whether to evaluate data for the last full period or for the period in progress. For example, if you select daily, then the KPI can either be based on the values up to yesterday, or be based on the values that include the day so far. You can also select a time zone. The default is your current time zone in WebSphere Business Modeler.

To calculate the KPI over a window of time that moves continuously, click **Rolling**. Select minutes, hours, days, or years and enter the number that you want, for example, 10 minutes or 90 days. If you select 90 days, the value of the KPI will be based on the last 90 days up to the current time.

To calculate the KPI over a single time period, click **Fixed** and select the start date and the end date. If you specify a start date only, the KPI is calculated beginning at that date and continuing to the current date. If you specify an end date only, the KPI is calculated from

the time the process is deployed until the end date. Select the time zone. The default is your current time zone in WebSphere Business Modeler.

To add an alert based on the value of the KPI, click **Specify when to send an alert and the action to take as a result**.

- Click **Add**.
- Click the **Alert Description** cell. Describe the conditions under which an alert should be sent and what should happen as a result of the alert. For example, you could type If the value of the KPI dips into the Poor range, send an e-mail to the manager or If the value of the KPI exceeds the target, notify Marketing.

To restrict the set of information that will be used to calculate the value of the KPI at run time, click **Select the dimensions to be used as filters and add the values of interest**. All the dimensions that you have previously added are displayed.

To add a new dimension, click **Add**. Change the default name of the dimension to a dimension name such as Location, Sales Representative, or Product.

To restrict the set of information based on the dimension, select the check box. For example, if you have a City dimension and want to limit the calculation of this KPI to a specific city, you would select the City dimension.

- Type a value to use as the filter value in the **Values to Include** column. For example, for a KPI called Average Order Amount in London, you would type London. For a KPI called Average Order Amount in New York and Los Angeles, you would type New York, Los Angeles.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Custom business measure: key performance indicator (4)

## Custom business measure: key performance indicator (4)

**▼ KPI Data Filter**

You can restrict the information that will be included in the calculation of the KPI. For example, for your Sales In London KPI, you could set the data filter name to City and the value to London.

☒ Specify data filters to limit the values included in the calculation of this KPI

Data Filter Name	Instance Metric	Operator	Values to Include	
Credit Request Dimension		equal to		

Add

Remove

Restrict the set of information that will be used to  
calculate the value of the KPI at run time

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Figure 7-23. Custom business measure: key performance indicator (4)

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Custom business measure: instance metric (1)

## Custom business measure: instance metric (1)

The screenshot displays the 'Business Measure Information' and 'Alerts' sections of the IBM Business Process Manager console.

**Business Measure Information**

- Name:** Credit Request Amount
- Type:** ☐ KPI ☒ Instance metric ☐ Aggregate metric ☐ Unspecified
- Description:** This metric measures the value of an attribute of the input to Collect Credit Information.

**Type and Default Value**

- ☒ Specify a default value and type
- Type:** Text
- Default value:** 10000

**Alerts**

You can specify instructions for notification when specific conditions occur, email.

- ☒ Specify when to send an alert and the action to take as a result

Alert Description
When the credit request amount is less than 100
When the credit request amount is greater than 50000

Two yellow callout boxes are present:

- Specify a default value (pointing to the Type and Default Value section)
- Add an alert based on the value of the metric (pointing to the Alerts section)

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Figure 7-24. Custom business measure: instance metric (1)

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### Notes:

Instance metrics capture information across a single run of the process.

To add an alert based on the value of the metric, click **Specify when to send an alert and the action to take as a result**.

- Click **Add**.
- Click the **Alert Description** cell. Describe the conditions under which an alert should be sent and what should happen as a result of the alert. For example, you could type If the Shipping Duration is longer than 10 days, notify the shipping manager.



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Custom business measure: instance metric (2)

## Custom business measure: instance metric (2)

**Instance Metric Calculation Details**

Specify the method used to calculate this instance metric.

☒ Specify how to calculate this instance metric

☒ Using a predefined business measure template for a process element

Template:

Process element:

Attribute:

☐ Using an expression involving other instance metrics

**Dashboard Samples**

Dashboards present continuously updated business measures data in a graphical format to make it easy to track process performance.

An instance metric contains a value resulting from one run of the process, such as "Number of items in order." This type of data can be displayed in the following dashboards:

Alerts: Displays alerts that notify users of defined situations occurring at run time.

Instances: Displays the business measures for individual instances or user-defined groups of instances.

**Instances**

CustNameDisp	date OrderedDisp	order_
Smith	2007-07-13 11:10:04.1	↓
Zucker	2007-08-12 11:12:02.2	↓

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Figure 7-25. Custom business measure: instance metric (2)

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### Notes:

To create an aggregate metric based on the instance metric, click **Specify how to aggregate this measure across multiple runs of the process**. Both the instance metric and the corresponding aggregate metric will be created when you export the business measures.

- Click **Add**.
- Click the **Name** cell and select the name that will be used in the dashboards, such as Average Order Cost or Minimum Shipping Time.
- Click the **Function** cell and select the function that corresponds to the name (such as **Average** or **Minimum**).

To specify data categories that you can use to organize and select data for reporting and analysis, click **Specify the categories that will be available in the dashboards for analysis of the metric**. All of the dimensions that you have previously added are displayed. To add a new dimension, click **Add** and change the default name of the

dimension to a dimension name such as City, Sales Representative, or Product. Any dimensions that you add become available for use in the dashboards.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Custom business measure: aggregate metric (1)

## Custom business measure: aggregate metric (1)

Business Measure Information

Name

Credit Risk

Type

☐ KPI
 ☐ Instance metric
 ☒ Aggregate metric
 ☐ Unspecified

Business Measure Details

Dashboard Samples

Dashboards present continuously updated business measures data in a graphical format to make it easy to track process performance.

An aggregate metric is calculated across multiple runs of the process, and is used for finding the average, maximum, minimum, total, or the number of occurrences. This type of data can be displayed in the following dashboards:

Dimensions:

Provides a multidimensional view of business performance data. Charts and grids present data for analysis against different dimensions.

Reports:

Displays performance reports relative to a time axis. Such reports typically contain tables and graphs with textual descriptions of the analysis.

Dimensions

Dimension	Green Bar Value (approx.)	Blue Bar Value (approx.)
Price	230	350
Instances	130	90
Orders	320	280
Estimates	300	300

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Figure 7-26. Custom business measure: aggregate metric (1)

WB286 / VB2861.0

### Notes:

Aggregate metrics are calculated across multiple runs (or instances) of the process so that you can find the average, maximum, minimum, sum, or number of occurrences.

To specify the aggregation function to apply to the underlying instance metric, click **Specify how this measure is aggregated across multiple runs of the process** and select the function. For example, specify **Average** for an Average Order Cost metric or **Minimum** for a Minimum Shipping Time metric. The underlying instance metric will be created by the developer in the Monitor Model editor in the WebSphere Business Monitor development toolkit.

To specify data categories that you can use to organize and select data for reporting and analysis, click **Specify the categories that will be available in the dashboards for analysis of the metric**. All of the dimensions that you have previously added are displayed. To add a new dimension, click **Add** and change the default name of the dimension to a dimension name such as City, Sales Representative, or Product. Any dimensions that you add become available for use in the dashboards.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Custom business measure: aggregate metric (2)

## Custom business measure: aggregate metric (2)

**Aggregation Function**

☒ Specify how to aggregate this measure across multiple runs of the process

Function: Average

Specify the aggregation function to apply to the underlying instance metric

**Aggregate Metric Calculation Details**

Specify an instance metric to use to calculate this aggregate metric.

☐ Specify how to calculate this aggregate metric

Instance metric to aggregate:

**Dimensions for Analysis**

You can provide an instance metric as the implementation for each dimension. For example, an instance metric can be the implementation for the city dimension.

☒ Specify the dimensions that will be available in the dashboards for analysis of this metric

Dimension	Instance Metric
Credit Request Dimension	
Zip Code	

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Figure 7-27. Custom business measure: aggregate metric (2)

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### Notes:

Aggregate metrics are calculated across multiple runs (or instances) of the process so that you can find the average, maximum, minimum, sum, or number of occurrences.

To specify the aggregation function to apply to the underlying instance metric, click **Specify how this measure is aggregated across multiple runs of the process** and select the function. For example, specify **Average** for an Average Order Cost metric or **Minimum** for a Minimum Shipping Time metric. The underlying instance metric will be created by the developer in the Monitor Model editor in the WebSphere Business Monitor development toolkit.

To specify data categories that you can use to organize and select data for reporting and analysis, click **Specify the categories that will be available in the dashboards for analysis of the metric**. All of the dimensions that you have previously added are displayed. To add a new dimension, click **Add** and change the default name of the dimension to a dimension name such as City, Sales Representative, or Product. Any dimensions that you add become available for use in the dashboards.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Custom business measure: unspecified



## Custom business measure: unspecified

- Used for communicating additional requirements

Optionally, you can create a business measure by applying a predefined template to a process element.

Template: Unspecified

Name:

Type: ☐ KPI ☐ Instance metric ☐ Aggregate metri ☒ Unspecified

Description:

Only has description field

▼ Dashboards

Select a metric type to display the associated dashboards.

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Figure 7-28. Custom business measure: unspecified

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Business Measures view: monitored values

## Business Measures view: monitored values

- Specify metric categories for monitored elements.
  - Indicates which values to return from WebSphere Business Monitor
- Multiple runs improve accuracy of simulations.
- Values in WebSphere Modeler are updated for goal analysis.

Business Performance Indicators Monitored Values

Monitored values

This section indicates which values you want returned from WebSphere Business Monitor after the process has been monitored.

Process Element	Processing Time	Processing Cost	Startup Cost	Revenue
Accept Credit	<input checked="" type="checkbox"/> Average Accep...	<input type="checkbox"/>	<input checked="" type="checkbox"/> Average Acce...	<input type="checkbox"/>
Accept Credit?				
Approve Credit?				
Assess Risk	<input checked="" type="checkbox"/> Average Asses...	<input checked="" type="checkbox"/> Average Asse...	<input type="checkbox"/>	<input type="checkbox"/>
Collect Credit Information	<input checked="" type="checkbox"/> Average Collect...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Credit Request	<input checked="" type="checkbox"/> Average Credit ...	<input checked="" type="checkbox"/> Average Credi...	<input type="checkbox"/>	<input checked="" type="checkbox"/> Average Cre...
Reject Credit	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Average Reje...	<input type="checkbox"/>
Request Management Approval	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Figure 7-29. Business Measures view: monitored values

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### Notes:

**Important:** Be selective. The number of attributes you select affects performance, so only select the attributes you need.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Exporting business measures

## Exporting business measures

---

- Business analyst exports a preliminary monitor model from WebSphere Business Modeler.
- Integration developer refines monitor model in the WebSphere Business Monitor development toolkit and then deploys it on WebSphere Business Monitor.
  - Monitor model from WebSphere Business Modeler provides guidance to the developer who will complete the model.
- Once monitored process has been executing for some time, business analyst exports the values captured by WebSphere Business Monitor to an XML file and imports them into WebSphere Business Modeler for further analysis on the process.

---

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Figure 7-30. Exporting business measures

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### **Notes:**

***Instructor notes:***

**Purpose —**

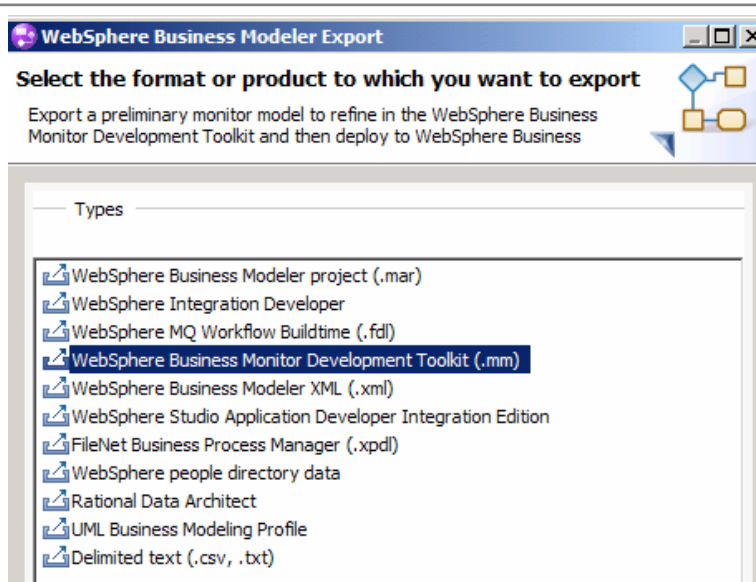
**Details —** This slide describes the outline of the next three slides.

**Additional information —**

**Transition statement —** Next: Sharing business measures with Monitor Development Toolkit

## Sharing business measures with Monitor Development Toolkit

- Export using the Business Monitor Development Toolkit (.mm) export type.
- This produces an MM file, along with SVG files for each of the elements selected for export.
  - The exported .svg is specially annotated for use with WebSphere Business Monitor.



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Figure 7-31. Sharing business measures with Monitor Development Toolkit

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### Notes:

***Instructor notes:***

**Purpose —**

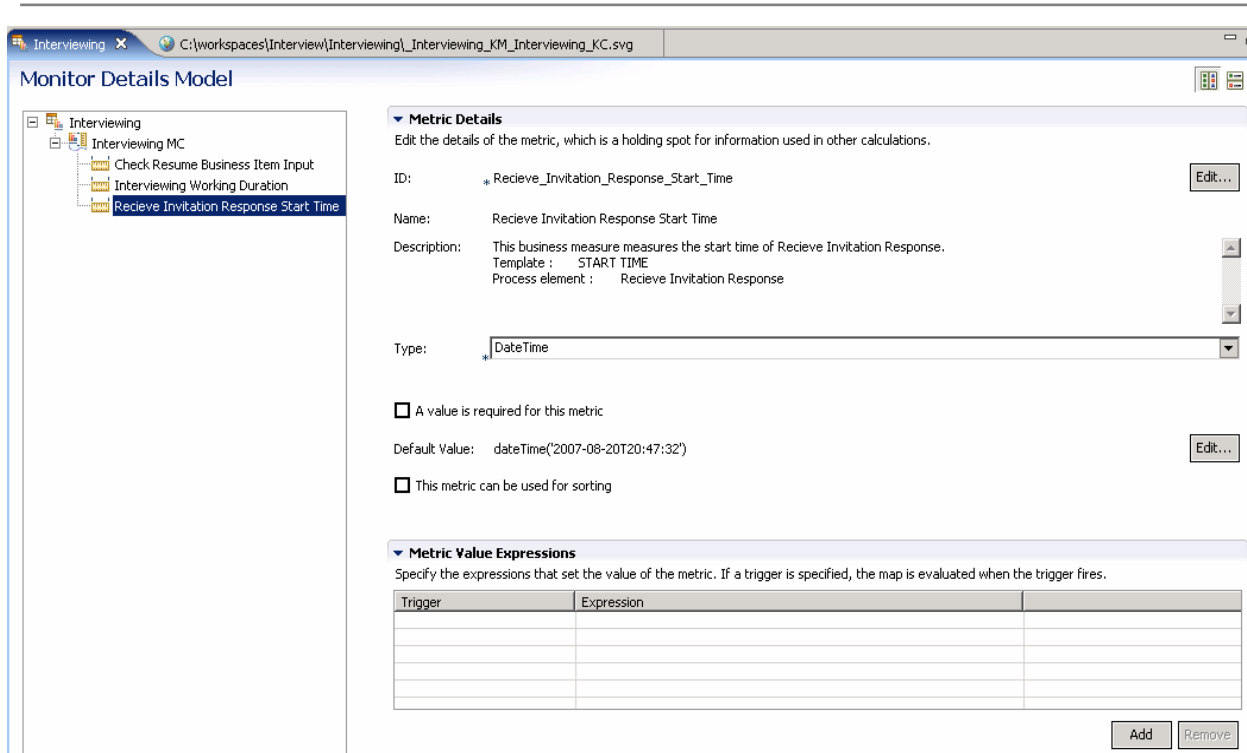
**Details —**

**Additional information —**

**Transition statement —** Next: The implementation is performed in Monitor Development Toolkit



## The implementation is performed in Monitor Development Toolkit



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Figure 7-32. The implementation is performed in Monitor Development Toolkit

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### Notes:

Key information from the WebSphere Business Modeler is brought over, such as the default timestamp in this case but the implementation is left to the integration developer.

***Instructor notes:***

**Purpose —**

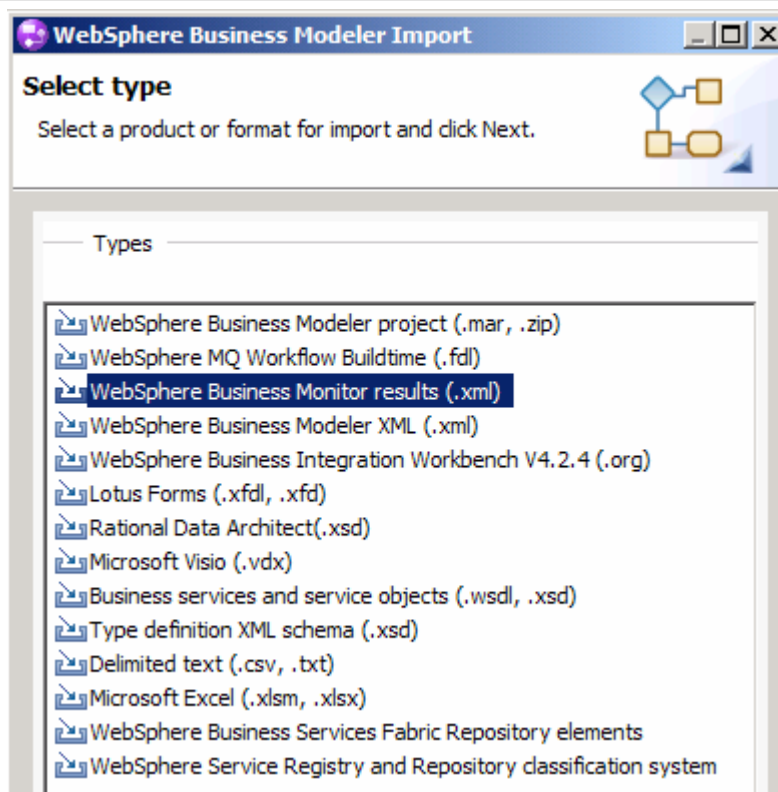
**Details —**

**Additional information —**

**Transition statement —** Next: Importing results from WebSphere Business Monitor

## Importing results from WebSphere Business Monitor

- Aggregated values from monitored process can be exported as an XML file and imported into WebSphere Business Modeler.
- Useful for simulation.



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Figure 7-33. Importing results from WebSphere Business Monitor

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### Notes:

Once a monitored process has been executing for some time, you can export the values captured by WebSphere Business Monitor to an XML file and import them into WebSphere Business Modeler for further analysis on the process.

Before you can import information, you must have used the **Monitored Values** tab to specify the values to collect in WebSphere Business Monitor. You must have exported a process from WebSphere Business Modeler and run it in WebSphere Business Monitor, and the process that you exported must still be available in the Project Tree view in WebSphere Business Modeler.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint

## Checkpoint

---

1. Why it is important to measure business performance?  
\_\_\_\_\_
2. What are the main elements in a business measures model?  
\_\_\_\_\_
3. What is a key performance indicator (KPI)?  
\_\_\_\_\_  
\_\_\_\_\_

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Figure 7-34. Checkpoint

WB286 / VB2861.0

### **Notes:**

Write your answers here:

- 1.
- 2.
- 3.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Unit summary

## Unit summary

Having completed this unit, you should be able to:

- Describe the purpose of WebSphere Business Monitor
- Describe the various WebSphere Business Monitor dashboards
- Define business measures and model elements
- Describe the capabilities of the Business Measures view in WebSphere Business Modeler

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Figure 7-35. Unit summary

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### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint solution



## Checkpoint solution

---

1. Why it is important to measure business performance?  
Business measures can be used to monitor and control business operations, drive improvement of process efficiency, and achieve organizational goals and objectives
2. What are the main elements in a business measures model?  
Key performance indicators and metrics
3. What is a key performance indicator (KPI)?  
KPIs are used in measuring business performance that are detailed specifications required to track business objectives.

---

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Figure 7-36. Checkpoint solution

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Exercise overview

## Exercise overview

---

In this exercise you will:

- Define business measures for Credit Request process
- Specify the following measures
  - Key Performance Indicators (KPI)
  - Instance metrics
  - Aggregate metrics
  - Monitored values

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Figure 7-37. Exercise overview

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —**

# Unit 8. Exporting from WebSphere Business Modeler

## Estimated time

00:45

## What this unit is about

This unit describes the export from WebSphere Business Modeler.

## What you should be able to do

After completing this unit, you should be able to:

- Describe the various types of exports from WebSphere Business Modeler:
  - WebSphere Business Modeler project
  - WebSphere Integration Developer
  - WebSphere MQ Workflow buildtime
  - WebSphere Business Monitor Development Toolkit
  - WebSphere Business Modeler XML
  - WebSphere Studio Application Developer Integration Edition
  - FileNet Business Process Manager
  - Rational Data Architect
  - UML Business Modeling Profile
  - Delimited text

## How you will check your progress

- Checkpoint
- Lab exercises

## References

None

## Unit objectives

---

After completing this unit, you should be able to:

- Describe the various types of exports from WebSphere Business Modeler:
  - WebSphere Business Modeler project
  - WebSphere Integration Developer
  - WebSphere MQ Workflow buildtime
  - WebSphere Business Monitor Development Toolkit
  - WebSphere Business Modeler XML
  - WebSphere Studio Application Developer Integration Edition
  - FileNet Business Process Manager
  - Rational Data Architect
  - UML Business Modeling Profile
  - Delimited text

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Figure 8-1. Unit objectives

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### **Notes:**

***Instructor notes:***

**Purpose** — To introduce the content of this unit.

**Details** —

**Additional information** —

**Transition statement** — Next: Exporting data from Modeler

## Exporting data from Modeler

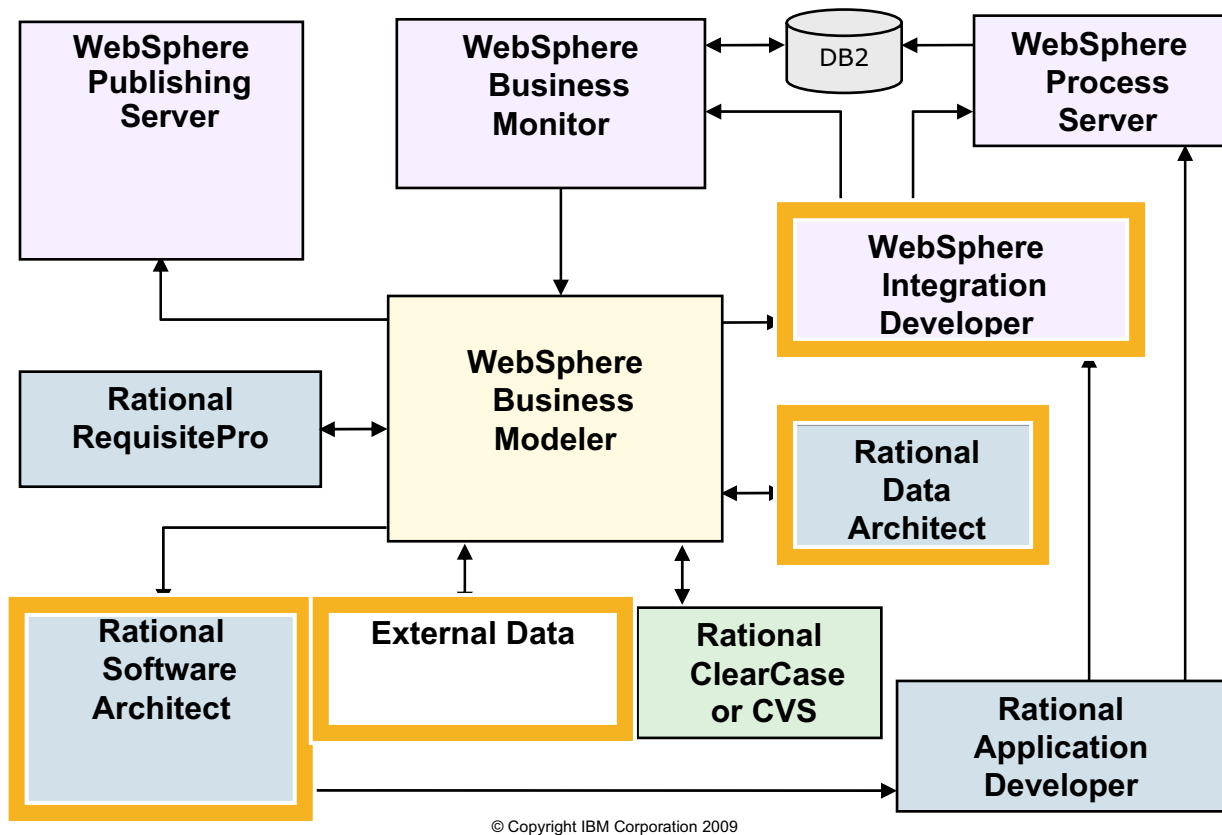


Figure 8-2. Exporting data from Modeler

WB286 / VB2861.0

### Notes:



***Instructor notes:***

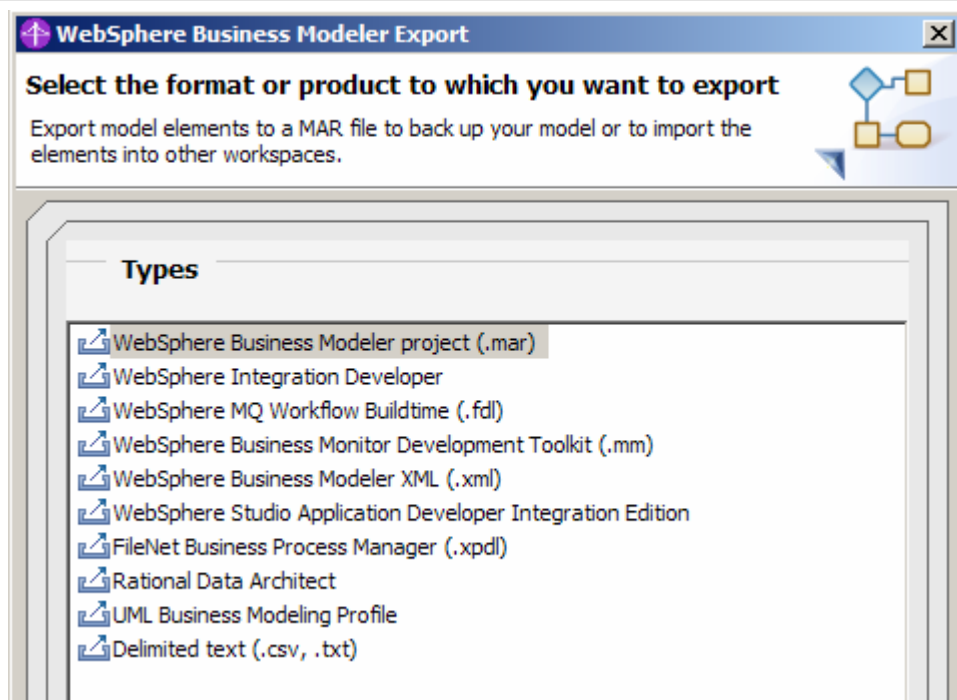
**Purpose —**

**Details —** This diagram will be used to position the different units throughout the course.

**Additional information —**

**Transition statement —** Next: Modeler export

## Modeler export



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Figure 8-3. Modeler export

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### Notes:

***Instructor notes:***

**Purpose** — The export wizard from Modeler to select the formats for exporting the models.

**Details** —

**Additional information** —

**Transition statement** — Next: Exporting models to different formats (1)

## Exporting models to different formats (1)

---

- WebSphere Business Modeler project
  - Exports the selected project or elements into a MAR file
- WebSphere Integration Developer
  - Exports Service Component Architecture (SCA) artifacts and Business Process Execution Language (BPEL), Web Services Description Language (WSDL), and XML Schema Definition (XSD) files that can be imported into WebSphere Integration Developer to create an implementation for WebSphere Process Server
- WebSphere MQ Workflow Buildtime
  - Exports the selected project or element into a FlowMark Definition Language (FDL) file
- WebSphere Business Monitor Development Toolkit
  - Exports to an MM (monitor model) file and to two or more SVG files
- WebSphere Business Modeler XML
  - Exports the selected project or element into an XML file

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Figure 8-4. Exporting models to different formats (1)

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### **Notes:**

**Instructor notes:**

**WebSphere Business Modeler project** exports the selected project or elements into a MAR file. This file can then be imported by another copy of WebSphere Business Modeler, providing a way of sharing business process models. This format is the recommended one to use when sharing models because it exports all of the information captured by WebSphere Business Modeler about a project or element. For example, this export includes position information for diagrams while other exports, such as WebSphere Business Modeler XML, do not. Use this type of export to share projects between members of a modeling team.

**WebSphere Integration Developer** exports Service Component Architecture (SCA) artifacts and Business Process Execution Language (BPEL), Web Services Description Language (WSDL), and XML Schema Definition (XSD) files that can be imported into WebSphere Integration Developer to create an implementation for WebSphere Process Server.

**WebSphere MQ Workflow Buildtime** exports the selected project or element into a FlowMark Definition Language (FDL) file. This file can then be imported into IBM WebSphere MQ Workflow Buildtime. Note that if you import an FDL file into WebSphere Business Modeler and then export it out again as an FDL file, the export file may not be the same as the import file due to transformations that occurred while importing the information into WebSphere Business Modeler.

**WebSphere Business Monitor Development Toolkit** exports to an MM (monitor model) file and to two or more SVG files. The monitor model can be refined in the toolkit and then deployed to WebSphere Business Monitor.

**WebSphere Business Modeler XML** exports the selected project or element into an XML file. The file conforms to the WebSphere Business Modeler schema. The schema provides an external interchange format that other modeling tools can use to obtain information from WebSphere Business Modeler. The schema is in the \samples\import\xml folder.

**Purpose —****Details —****Additional information —**

**Important:** Models created in WebSphere Business Modeler are not guaranteed to work correctly in the other tools. When you are converting files, you should be aware of the following:

If you plan to export FDL, BPEL, or SCA artifacts, you should first ensure you are working in the appropriate mode (WebSphere MQ Workflow, WebSphere Business Integration Server Foundation, or WebSphere Process Server respectively) and that your model has no errors. These modes enforce restrictions on the models in WebSphere Business Modeler to ensure that the model can be imported into the other applications and function properly.

Based on what is specified in the model, it may not be possible to generate a complete process definition. For example, if the decision branches in the model have no formal expressions associated with them, no BPEL or FDL transition conditions will be generated.

No deployment-related information is generated when you export the files. This information will be generated when you import the files into Application Developer Integration Edition, WebSphere Integration Developer, or WebSphere MQ Workflow.

**Transition statement** — Next: Exporting models to different formats (2)

## Exporting models to different formats (2)

---

- WebSphere Studio Application Developer Integration Edition
  - Exports the selected project or elements into BPEL, WSDL, and XSD files. These files can then be imported into IBM WebSphere Studio Application Developer Integration Edition.
- FileNet Business Process Manager
  - Exports the selected process or process catalog as XPD files. These files can then be opened with the Process Designer of FileNet P8 to create implementations for the FileNet P8 runtime environment.
- Rational Data Architect
  - Exports the selected business objects into XSD files. These files can then be imported into Rational Data Architect through the use of an XML to LDM transform.
- UML Business Modeling Profile
  - Exports the selected project or elements into a UML 1.4 XMI 1.1 file.
- Delimited text
  - Exports the selected project or element into a text file.

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Figure 8-5. Exporting models to different formats (2)

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### **Notes:**

**Instructor notes:**

**WebSphere Studio Application Developer Integration Edition** exports the selected project or elements into BPEL, WSDL, and XSD files. These files can then be imported into IBM WebSphere Studio Application Developer Integration Edition.

**FileNet Business Process Manager** exports the selected process or process catalog as XPDL files. These files can then be opened with the Process Designer of FileNet P8 to create implementations for the FileNet P8 runtime environment.

**Rational Data Architect** exports the selected business objects into XSD files. These files can then be imported into Rational Data Architect through the use of an XML to LDM transform.

**UML Business Modeling Profile** exports the selected project or elements into a UML 1.4 XMI 1.1 file. Each data definition is mapped to a UML Class, and each process is mapped to a UML Use Case and associated with a UML Activity Graph to represent the process flow. The resulting file of the export can be imported into IBM Rational XDE (eXtended Development Environment) 2003.06.00 or 2003.06.12 edition.

**Delimited text** exports the selected project or element into a text file. The fields that describe elements are separated by delimiters (special characters). The delimited text file can be imported into any application, such as Microsoft Excel, that imports delimited text.

**Purpose —****Details —****Additional information —**

**Important:** Models created in WebSphere Business Modeler are not guaranteed to work correctly in the other tools. When you are converting files, you should be aware of the following:

If you plan to export FDL, BPEL, or SCA artifacts, you should first ensure you are working in the appropriate mode (WebSphere MQ Workflow, WebSphere Business Integration Server Foundation, or WebSphere Process Server respectively) and that your model has no errors. These modes enforce restrictions on the models in WebSphere Business Modeler to ensure that the model can be imported into the other applications and function properly.

Based on what is specified in the model, it may not be possible to generate a complete process definition. For example, if the decision branches in the model have no formal expressions associated with them, no BPEL or FDL transition conditions will be generated.

No deployment-related information is generated when you export the files. This information will be generated when you import the files into Application Developer Integration Edition, WebSphere Integration Developer, or WebSphere MQ Workflow.

**Transition statement —** Next: WSBPEL: Business Process Execution Language



---

## WSBPEL: Business Process Execution Language

---

- WSBPEL is also referred to as BPEL.
  - Industry standard for Web services choreography
  - Published by IBM, Microsoft, and BEA (plus SAP and Siebel)
- Language describes simple or complex exchanges that characterize business partner interactions.
- Defines control elements for workflow.
- Creates a fully-executable, portable script.
- Modeler can export process models to WebSphere Integration Developer. It includes files in three formats: BPEL (Business Process Execution Language), WSDL (Web Services Description Language), and XSD (XML Schema Definition). These files import to WebSphere Integration Developer to develop executable application code.

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Figure 8-6. WSBPEL: Business Process Execution Language

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### **Notes:**

***Instructor notes:***

**Purpose —**

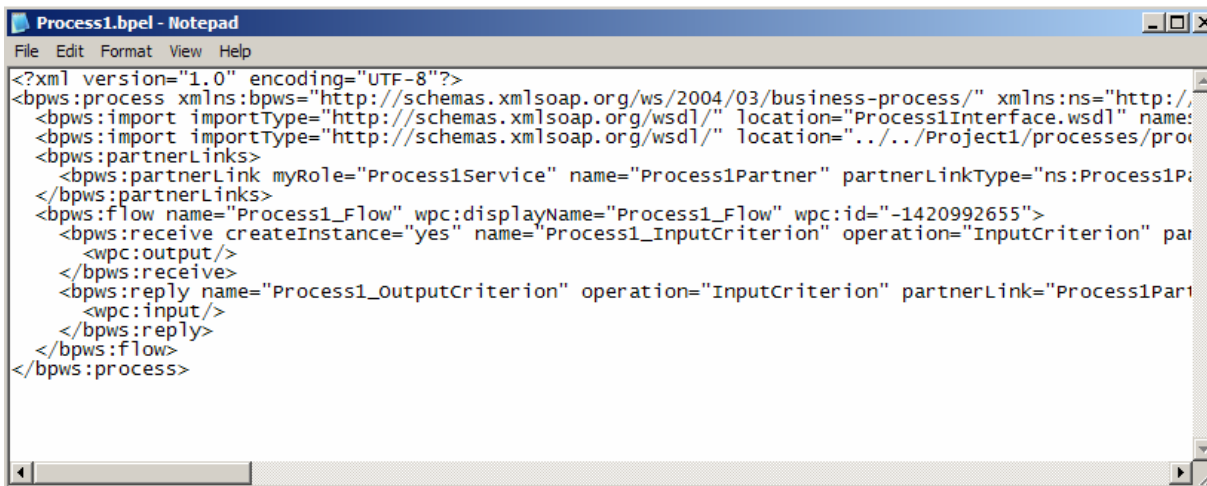
**Details —**

**Additional information —**

**Transition statement —** Next: Export to BPEL

## Export to BPEL

- For each process, one BPEL and one WSDL file are created
  - If the process references a global process, task, or services, additional WSDL files are created for each
- XSD files are created for business items used within the process
- The generated files are placed in subdirectories based on the catalog hierarchy of the process and business items



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Figure 8-7. Export to BPEL

WB286 / VB2861.0

### Notes:

***Instructor notes:***

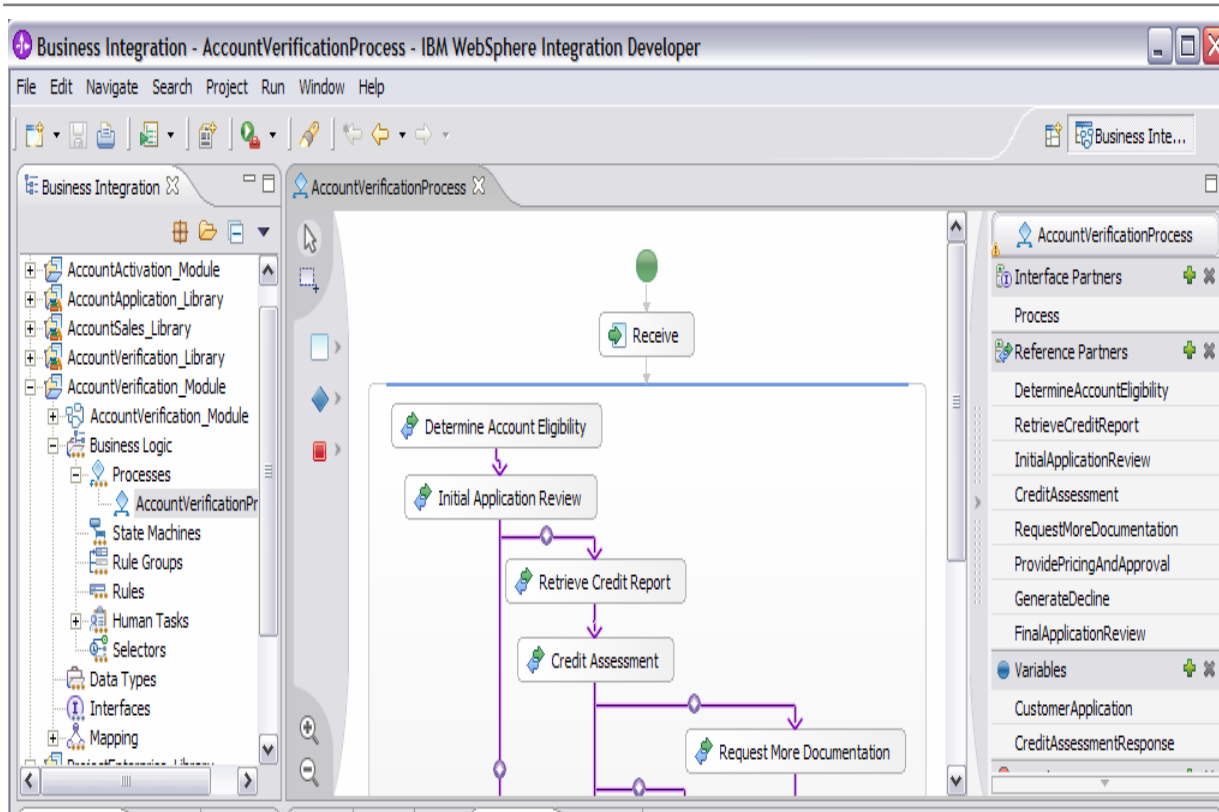
**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: BPEL diagram in IBM WebSphere Integration Developer

## BPEL diagram in IBM WebSphere Integration Developer



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Figure 8-8. BPEL diagram in IBM WebSphere Integration Developer

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —** WebSpher Integration Developer displays a process vertically from the top to bottom.

**Additional information —**

**Transition statement —** Next: FDL: FlowMark Definition Language

## FDL: FlowMark Definition Language

- FDL:
  - Defines all possible paths through the Business Process including the rules that define which paths should be taken and all actions that need to be performed
- WebSphere Business Modeler continues to export processes as FDL for import into WebSphere MQ Workflow.
- Use of FDL as a modeling language is superseded by WSBPEL.

```

/*
Source      : IBM WBI Workbench
Target      : IBM MQWorkflow
Build of    : 2/15/2003
*/
CODEPAGE 1252
FM_RELEASE V3R4 0

/*
=====
                          Levels
=====*/
UPDATE LEVEL 0
END 0
UPDATE LEVEL 1
      DESCRIPTION 'Employees at this level can perform most tasks'
END 1
UPDATE LEVEL 2
END 2
UPDATE LEVEL 3
END 3
UPDATE LEVEL 4
END 4
UPDATE LEVEL 5
END 5
UPDATE LEVEL 6
END 6
UPDATE LEVEL 7
END 7
UPDATE LEVEL 8
END 8
UPDATE LEVEL 9
END 9
/*
=====
                          Structures
=====*/

```

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Figure 8-9. FDL: FlowMark Definition Language

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

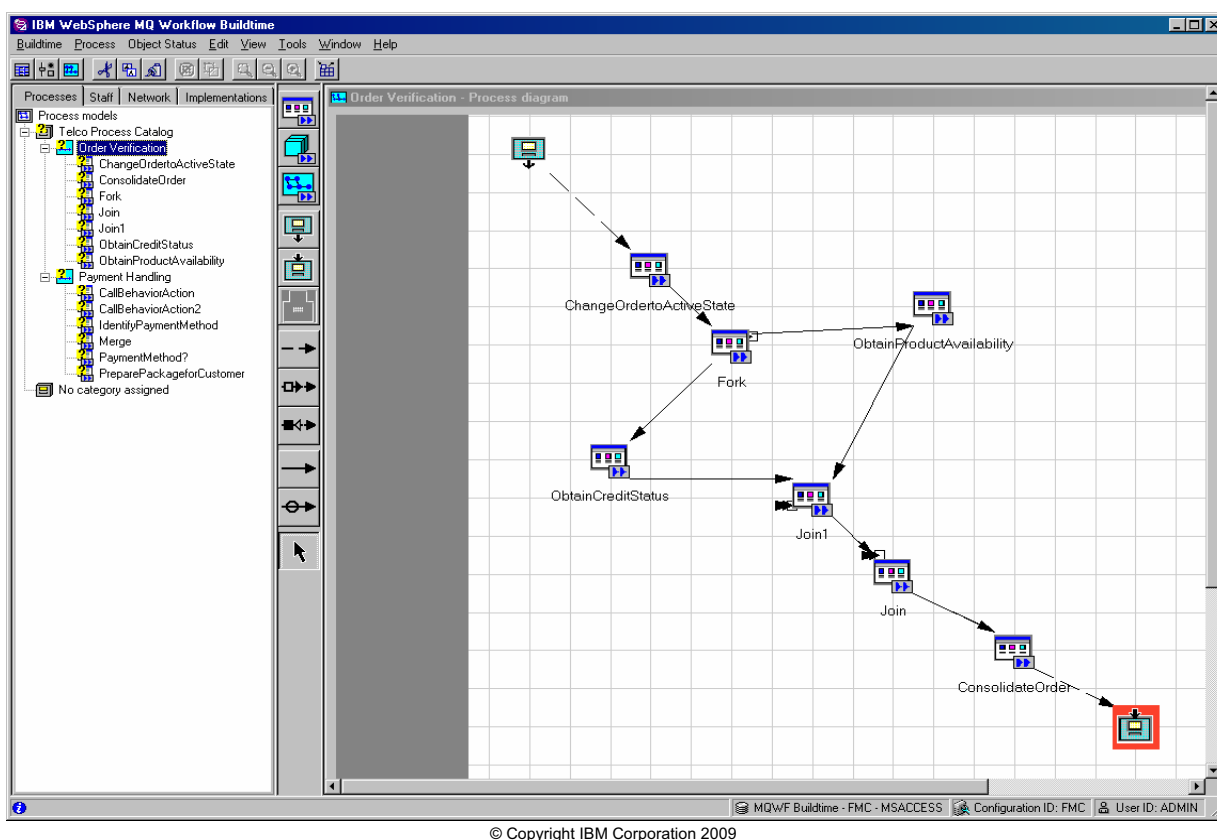
**Details —**

**Additional information —**

**Transition statement —** Next: Transformation into MQ Workflow Buildtime



# Transformation into MQ Workflow Buildtime



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Figure 8-10. Transformation into MQ Workflow Buildtime

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## Notes:

This graphic shows a model that has been imported from modeler (now represented in the form of MQ Workflow) and which can have technical items added.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: FDL elements not supported

## FDL elements not supported

The following FDL elements are not generated when exporting from Modeler to FDL files:

- Process attributes
  - Global container
  - Process administrator
  - Duration of process
  - Control setting (Control tab settings on process: audit trail, notification mode, etc )
  - Activity setting (Activity tab settings on process)
- Program/Process activity attributes
  - Execution setting (Execution tab setting on program/process activity: execution server, and so on)
  - Expiration
  - Tools
  - Notification
  - Control setting (Control tab settings on program/process activity)
  - System (on process activity)
- Connector
  - Data loop connector
  - Default connector
  - Default data connector (generated only for an empty activity)
- Network
  - Anything related to network topology (such as UPES or queue manager) is not supported
- Program
  - Programs are not supported (an empty program is generated for any program activity that is generated)
- Visuals
  - Visual information is not exported

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Figure 8-11. FDL elements not supported

WB286 / VB2861.0

### Notes:

This is a reference slide for those who will be using MQ workflow; it describes what is generated and what is not generated.

***Instructor notes:***

**Purpose —**

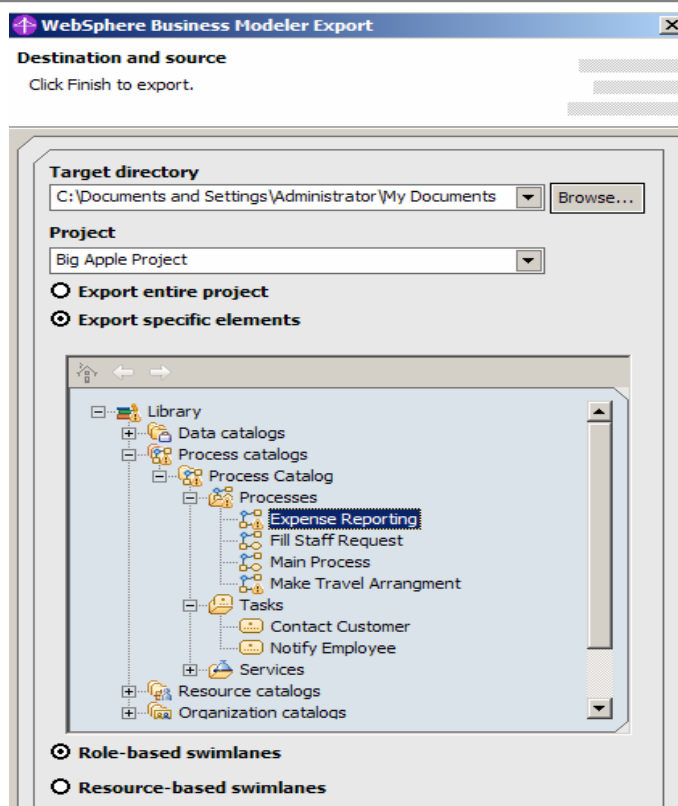
**Details —**

**Additional information —**

**Transition statement —** Next: Export UML from Modeler

## Export UML from Modeler

- Either export the entire project or specific objects.
- Two options for export:
  - Role-based swimlanes partitions in the UML Activity Graph to be created for each role
  - Or, Resource-based swimlanes partitions in the UML Activity Graph to be created for each resource
- After export, an XML file will be created using the name of the project, and the file extension is XML.
- The XML file can be imported into Rational Software Architect.



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Figure 8-12. Export UML from Modeler

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

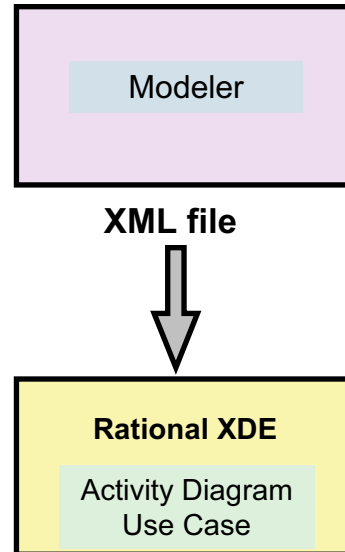
**Details —**

**Additional information —**

**Transition statement —** Next: Export to UML for application development

## Export to UML for application development

- Export models to UML file which can be imported into IBM Rational XDE.
- Modeler elements are mapped to UML constructs and saved to an XML file.
- Each data definition is mapped to a UML Class, and each process is mapped to a UML Use Case and associated with a UML Activity Graph to represent the process flow.



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Figure 8-13. Export to UML for application development

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### Notes:

Rational XDE has the following key features and benefits:

- Single design-to-code experience
- Automatic or manual code synchronization
- User-definable patterns and code templates to automate repetitive coding tasks
- Multiple model support
- Free-form modeling to enhance diagrams with pictures, shapes, and colors
- Database modeling and synchronization
- Web publishing and report generation

***Instructor notes:***

**Purpose —**

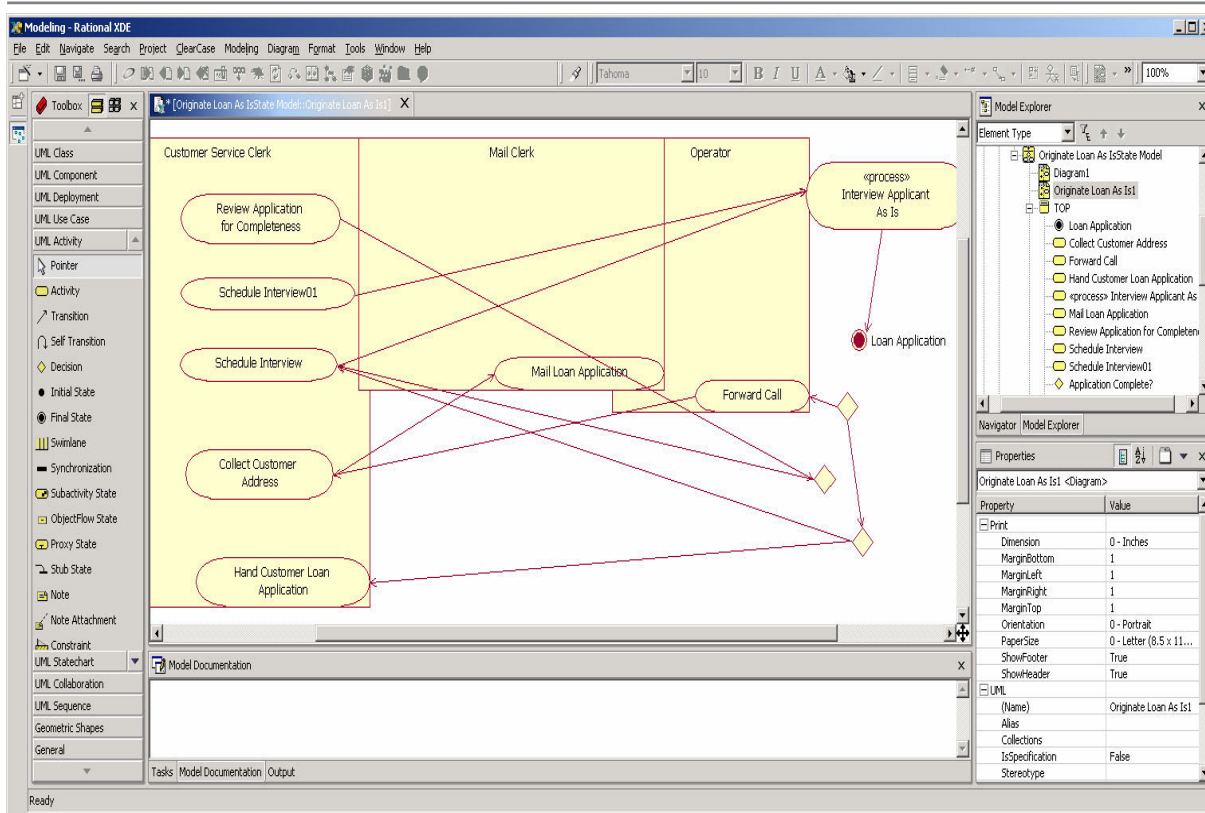
**Details —**

**Additional information —**

**Transition statement —** Next: Display activity diagram in Rational XDE



# Display activity diagram in Rational XDE



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Figure 8-14. Display activity diagram in Rational XDE

WB286 / VB2861.0

## Notes:

***Instructor notes:***

**Purpose —**

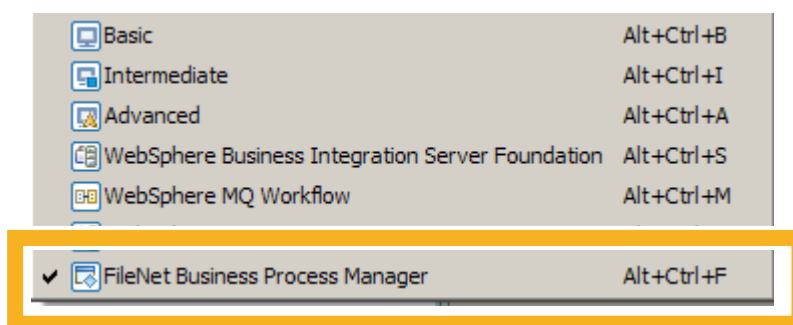
**Details —**

**Additional information —**

**Transition statement —** Next: FileNet Business Process Manager mode

## FileNet Business Process Manager mode

- Prevents the addition of unsupported process elements
  - Observers
  - Timers
  - Notification broadcasters
  - Notification receivers
  - Global tasks
  - Global services
  - Global repositories
  - Business services
- Marks pre-existing unsupported elements as errors
- Requires expressions for all decision choices



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Figure 8-15. FileNet Business Process Manager mode

WB286 / VB2861.0

### Notes:

Once you switch to the FileNet Business Process Manager Mode in Modeler, the FileNet validation will apply.

***Instructor notes:***


**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Modeler: integration with FileNet

## Modeler: integration with FileNet

- Enables user to create processes in WebSphere Business Modeler and then import them into FileNet Business Process Manager for further refinement and execution.
- FileNet Business Process Manager modeling mode: 
  - Supports creating FileNet-compatible process models that can be exported into the FileNet Business Process Manager by validating processes
  - Marks elements that do not have an equivalent in FileNet.
  - Exports processes as XPD and XSD files which can then be imported into the FileNet Business Process Manager
- User should have extensive experience using WebSphere Business Modeler Advanced and FileNet Business Process Manager.

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Figure 8-16. Modeler: integration with FileNet

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### Notes:

IBM FileNet Business Process Manager is a separate product; it is not packaged with WebSphere Business Modeler.

The FileNet Business Process Manager mode provides additional validation to the Advanced Business Modeling mode to support creating a model that can be successfully imported into the FileNet P8 platform.

***Instructor notes:***

**Purpose —**

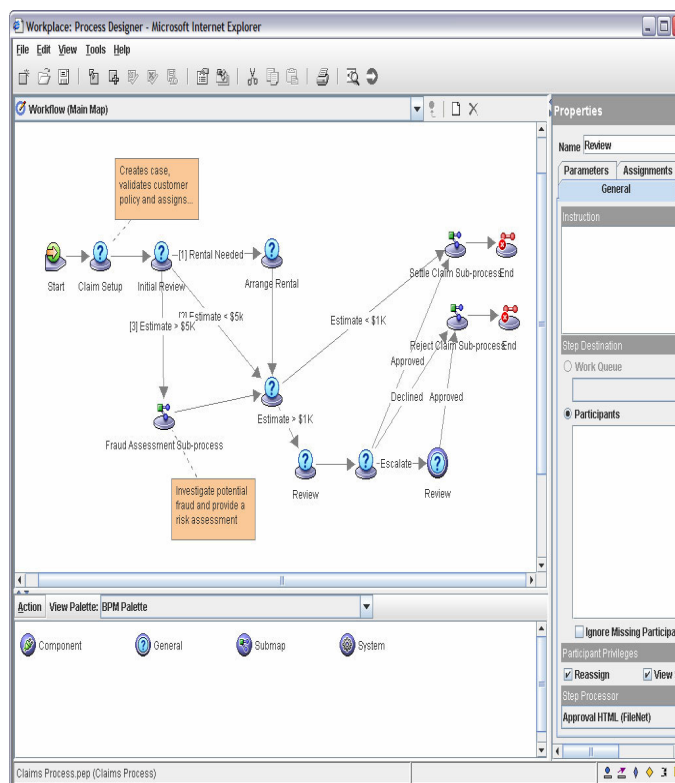
**Details —**

**Additional information —**

**Transition statement —** Next: IBM FileNet Business Process Manager

# IBM FileNet Business Process Manager

- Standard-based process modeling for business
  - Supports Business Process Modeling Notation (BPMN)
  - Read and produce process definition in XML Process Definition Language (XPDL) format
- 100% Web-based tool
  - easily accessible while minimizing deployment costs
- Process Simulation
  - based on real execution data or assumed scenarios
- Integrated content management
  - Process flows are primarily document-driven
- Versioning and collaboration support
  - Supports rapid deployment of improved processes while minimizing the impact on normal operations



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Figure 8-17. IBM FileNet Business Process Manager

WB286 / VB2861.0

## Notes:

Business Process Manager is an Enterprise Content Management (ECM) solution that allows companies and government agencies to automate, streamline and optimize their complex business processes. With this solution, processes supporting millions of transactions and thousands of users can be quickly deployed and easily modified so organizations can better respond to changing conditions.

IBM FileNet Business Process Manager automates and optimizes business processes by managing workflow and content among people and systems.

The XML Process Definition Language (XPDL) is a format standardized by the Workflow Management Coalition (WfMC) to interchange Business Process definitions between different workflow products like modeling tools and workflow engines. XPDL defines a XML schema for specifying the declarative part of workflow.

***Instructor notes:***

**Purpose —**

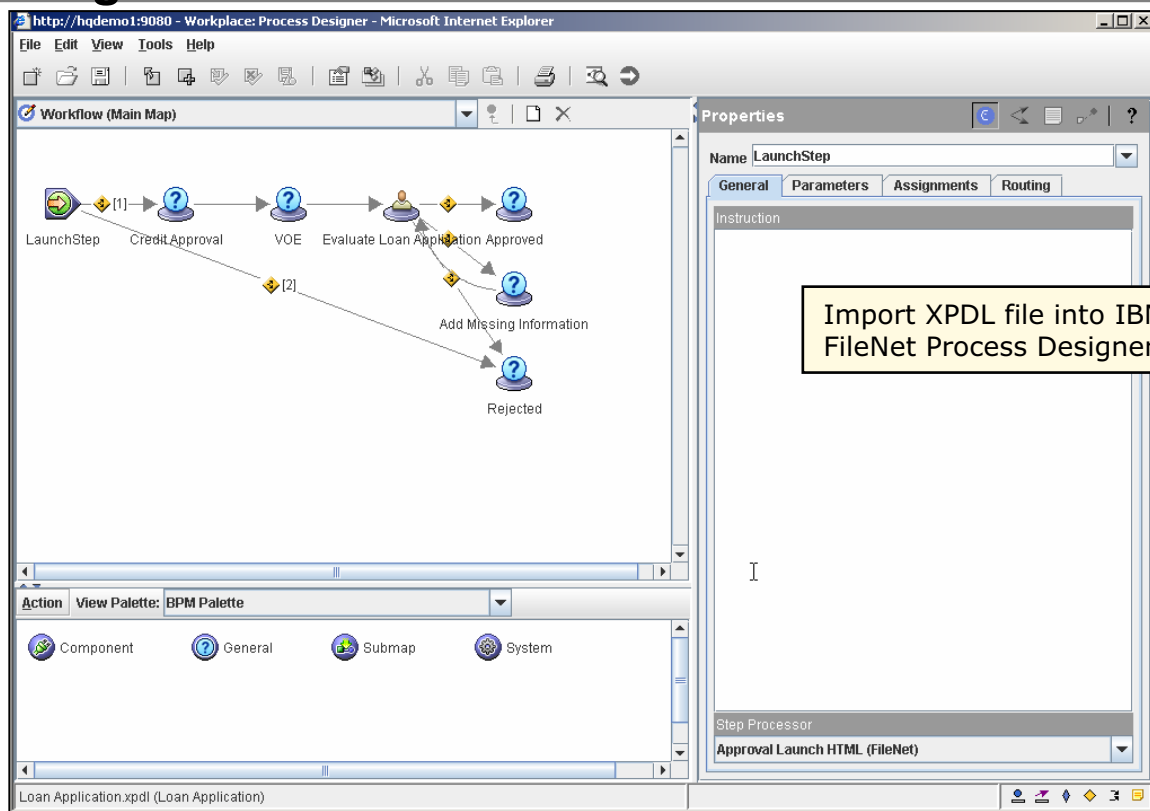
**Details —**

**Additional information —**

**Transition statement —** Next: IBM FileNet Business Process Manager: Process Designer



# IBM FileNet Business Process Manager: Process Designer



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Figure 8-18. IBM FileNet Business Process Manager: Process Designer

WB286 / VB2861.0

## Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Delimited text export

## Delimited text export

---

- Elements that can be exported
  - Business items
    - File name of business item adds "\_bi.txt"
  - Business item templates
    - File name of business item template adds "\_bit.txt"
- Attributes that are not supported:
  - Expressions (used in rules and in default values)
  - Complex types
- Roles are referred to as "qualifications" in the exported delimited text files.

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Figure 8-19. Delimited text export

WB286 / VB2861.0

### **Notes:**

## ***Instructor notes:***

### **Purpose —**

**Details —** Modeler can import work from previous process mapping projects, in some cases even the primary connected mapping elements themselves -- export facilitates transfer of the information to downstream software tools supporting some versions of UML and BPEL for BPM.

### **Additional information —**

**Delimited text** exports the selected project or element into a text file. The fields that describe elements are separated by delimiters (special characters). The delimited text file can be imported into any application, such as Microsoft Excel, that imports delimited text.

**Transition statement —** Next: Checkpoint

## Checkpoint

---

1. Name some of the export formats supported by WebSphere Business Modeler.  

---
2. Name some of the delimited text attributes that are not supported by the Modeler export.  

---

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Figure 8-20. Checkpoint

WB286 / VB2861.0

### **Notes:**

Write your answers here:

1.

2.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Unit summary

## Unit summary

Having completed this unit, you should be able to:

- Describe the various types of exports from WebSphere Business Modeler:
  - WebSphere Business Modeler project
  - WebSphere Integration Developer
  - WebSphere MQ Workflow buildtime
  - WebSphere Business Monitor Development Toolkit
  - WebSphere Business Modeler XML
  - WebSphere Studio Application Developer Integration Edition
  - FileNet Business Process Manager
  - Rational Data Architect
  - UML Business Modeling Profile
  - Delimited text

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Figure 8-21. Unit summary

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Checkpoint solution



## Checkpoint solution

---

1. Name some of the export formats supported by WebSphere Business Modeler.
  - WebSphere Business Modeler project
  - WebSphere Integration Developer
  - WebSphere MQ Workflow buildtime
  - WebSphere Business Monitor Development Toolkit
  - WebSphere Business Modeler XML
  - WebSphere Studio Application Developer Integration Edition
  - FileNet Business Process Manager
  - Rational Data Architect
  - UML Business Modeling Profile
  - Delimited text
2. Name some of the delimited text attributes that are not supported by the Modeler export.
  - Expressions (used in rules and in default values) and complex types

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Figure 8-22. Checkpoint solution

WB286 / VB2861.0

### Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Exercise overview

## Exercise overview

---

In this exercise you will:

- Switch from Advance mode to WebSphere Process Server mode
- Examine and correct errors
- Export your ABC project in a format that can be imported into WebSphere Integration Developer

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Figure 8-23. Exercise overview

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —**

## Unit 9. Course review

### Estimated time

00:30

### What this unit is about

This unit describes the Modeler course summary.

### What you should be able to do

After completing this unit, you should be able to:

- Explain the key concepts that were covered in this course

### How you will check your progress

- Checkpoint
- Lab exercises

### References

None

## Unit objectives

---

After completing this unit, you should be able to:

- Explain the key concepts that were covered in this course

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Figure 9-1. Unit objectives

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### **Notes:**

***Instructor notes:***

**Purpose** — To introduce the content of this unit.

**Details** —

**Additional information** —

**Transition statement** — Next: The process drives development through the use of business services

## What is process simulation?

---

- Simulation:
  - The imitative representation of the functioning of one system or process by means of the functioning of another (a computer simulation of an industrial process). — Merriam-Webster
- Process simulation:
  - Using a computer program based on a set of mathematical formulas to imitate the behavior of a business process to determine how it behaves under different conditions.
  - If the model behaves in the same manner as the real process:
    - There is a good chance that the underlying variables are correct.
    - The model can be used to test the impact of changing conditions.
- Process simulation is a simulated performance of a real-world business process in a virtual environment.
  - The business process might be a model of:
    - An existing business process.
    - One that is planned for the future.

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Figure 9-2. What is process simulation?

WB286 / VB2861.0

### **Notes:**



***Instructor notes:***

**Purpose** — Define the function of simulation.

**Details** —

**Additional information** —

**Transition statement** — Next: Simulation terminology

## Simulation terminology

---

- Simulation snapshot
  - A record of the model that will be simulated
- Simulation profile
  - A record of the model plus the simulation attributes
- Statistics and results
  - The information that comes out of the simulation
- Probabilities or expressions
  - The way decisions are handled during simulation
- Tokens
  - Represent units of work passing through the process
- Process instances
  - Each execution of a process in a simulation
- Process cases
  - Each path through a process
- Random number generation
  - The introduction of real-life variability into a simulation

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Figure 9-3. Simulation terminology

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Element behavior in simulation

## Element behavior in simulation

---

- Process time and cost
  - Accumulates the attributes of all the included element attributes
  - Uses the process attributes if there are no elements inside
- Service time and cost
  - Uses the service attributes to determine how it performs work
- Task and map
  - Uses its attributes to determine the time and cost of its work
- Timer, broadcaster, receiver, repository, timetable
  - Uses the attributes to affect the behavior of the process
- Decisions, merges, forks and joins
  - Uses attributes to affect the flow of the process through probabilities or expressions
- Roles and resources
  - Determines time and cost based on specified allocations
  - Resource attributes take precedence over role attributes

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Figure 9-4. Element behavior in simulation

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose** — Define the function of simulation.

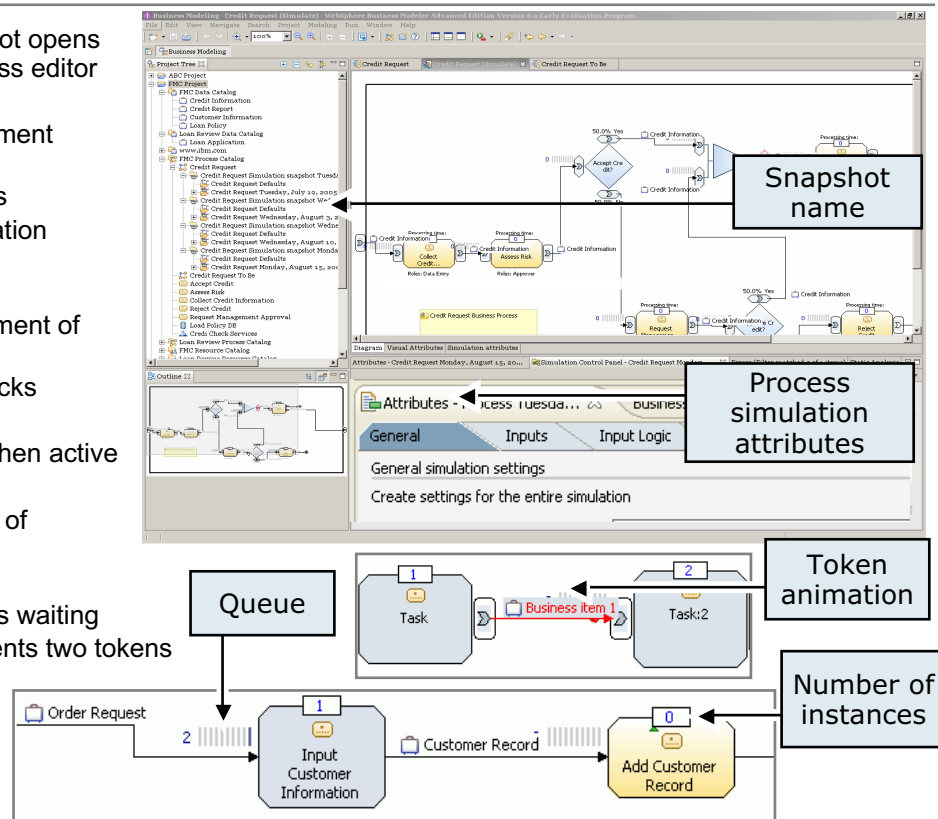
**Details** —

**Additional information** —

**Transition statement** — Next: Simulation snapshot

# Simulation snapshot

- The simulation snapshot opens in a tab over the process editor
  - Snapshot name
    - Rename to document settings
  - Simulation attributes
    - Define the simulation behavior
  - Token animation
    - Watch the movement of tokens
    - Look for bottlenecks
  - Activity color
    - Changes color when active
  - Instances
    - Displays number of instances
  - Queue
    - Number of tokens waiting
    - Each bar represents two tokens
  - Animation is not necessary
    - Turning off shortens execution time



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Figure 9-5. Simulation snapshot

WB286 / VB2861.0

## Notes:

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Dynamic analysis

## Dynamic analysis

---

- Profile analysis
  - Profile specification
  - Cases summary
- Dynamic analysis
  - Aggregated
  - Process instance
  - Process cases
  - Processes comparison

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Figure 9-6. Dynamic analysis

WB286 / VB2861.0

### **Notes:**



***Instructor notes:***

**Purpose — .**

**Details —**

**Additional information —**

**Transition statement —** Next: Process goal analysis

## Process goal analysis

---

- Process goals are derived from specific organization goals and customer requirements
  - Organizations achieve their goals through the operations of their processes
- Process goal analysis is used to analyze a process to determine how well it supports the organization's goals
  - The performance of the process is analyzed and evaluated against its goals
  - Allows the focus to be set on increasing the probabilities of process cases that support organizational goals
    - Therefore, it reduces the probabilities of cases that do not support goals

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Figure 9-7. Process goal analysis

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### **Notes:**

***Instructor notes:***

**Purpose — .**

**Details —**

**Additional information —**

**Transition statement —** Next: Redesign analysis

## Redesign analysis

---

- Shows the effects of adding tasks to, or deleting tasks from, a process during the redesign phase
- Use redesign analysis when you need to:
  - Identify improvement opportunities within a process
  - Measure the effects of redesigning a process

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Figure 9-8. Redesign analysis

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### **Notes:**

***Instructor notes:***

**Purpose — .**

**Details —**

**Additional information —**

**Transition statement —** Next: Custom reports

## Custom reports

---

- Reports are a formatted presentation of information relating to a model or to the results of analyzing a process simulation
  - Predefined report details
    - Numerous predefined reports available in the product
  - Custom reports — report designer
    - Report catalogs
      - Organize report templates for different projects or uses
    - Report templates
      - Produce detailed reports with specific content in a specified format
    - Report style masters
      - Reuse header and footer content for multiple report templates
- Crystal Reports
  - Alternative way of creating and generating report templates

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Figure 9-9. Custom reports

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose** — .

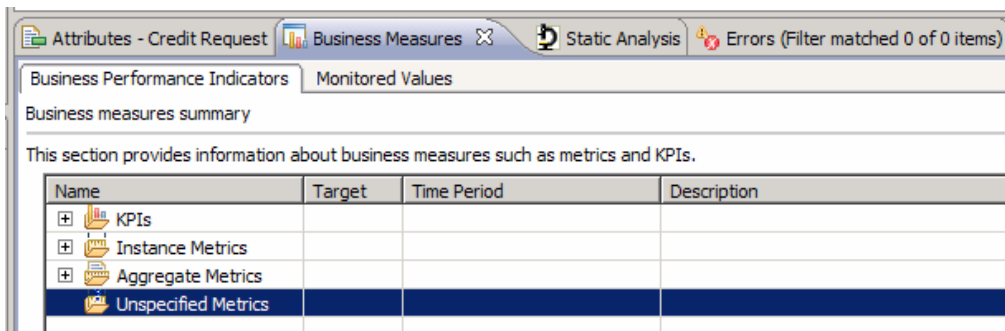
**Details** —

**Additional information** —

**Transition statement** — Next: Business measures in WebSphere Business Modeler

## Business measures in WebSphere Business Modeler

- Business measures in WebSphere Business Modeler provide a way for business analysts to specify what should be monitored when the business process is executing.
  - The business analyst has insight into key elements of the business process that could indicate the success or failure of strategic business goals.
- Business measures can be associated with process elements.
- Predefined and custom business measures can be built.
- The business analyst's specification of what should be monitored is exported to the WebSphere Business Monitor Development Toolkit.
  - The implementation is then completed by the integration developer.



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Figure 9-10. Business measures in WebSphere Business Modeler

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### Notes:

WebSphere Business Modeler provides a set of business measure templates for commonly monitored business measures.



***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Basic monitor model elements

## Basic monitor model elements

---

- Metric
  - Represents the value of a monitored item and helps in assessing performance in a particular business area
    - Example: Order processing time
  - Can have numeric values such as the number of items shipped, or non-numeric values such as the delivery dates of shipments
- Key performance indicator (KPI)
  - A quantifiable measure designed to track critical success factors of a business process
  - Example: Orders must be processed within three days (Order processing time < 3 days)

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Figure 9-11. Basic monitor model elements

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Exporting models to different formats (1)

## Exporting models to different formats (1)

---

- WebSphere Business Modeler project
  - Exports the selected project or elements into a MAR file
- WebSphere Integration Developer
  - Exports Service Component Architecture (SCA) artifacts and Business Process Execution Language (BPEL), Web Services Description Language (WSDL), and XML Schema Definition (XSD) files that can be imported into WebSphere Integration Developer to create an implementation for WebSphere Process Server
- WebSphere MQ Workflow Buildtime
  - Exports the selected project or element into a FlowMark Definition Language (FDL) file
- WebSphere Business Monitor Development Toolkit
  - Exports to an MM (monitor model) file and to two or more SVG files
- WebSphere Business Modeler XML
  - Exports the selected project or element into an XML file

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Figure 9-12. Exporting models to different formats (1)

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### **Notes:**

***Instructor notes:***

**Purpose** — .

**Details** —

**Additional information** —

**Transition statement** — Next: Exporting models to different formats (2)

## Exporting models to different formats (2)

---

- WebSphere Studio Application Developer Integration Edition
  - Exports the selected project or elements into BPEL, WSDL, and XSD files. These files can then be imported into IBM WebSphere Studio Application Developer Integration Edition.
- FileNet Business Process Manager
  - Exports the selected process or process catalog as XPD files. These files can then be opened with the Process Designer of FileNet P8 to create implementations for the FileNet P8 runtime environment.
- Rational Data Architect
  - Exports the selected business objects into XSD files. These files can then be imported into Rational Data Architect through the use of an XML to LDM transform.
- UML Business Modeling Profile
  - Exports the selected project or elements into a UML 1.4 XMI 1.1 file.
- Delimited text
  - Exports the selected project or element into a text file.

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Figure 9-13. Exporting models to different formats (2)

WB286 / VB2861.0

### **Notes:**

***Instructor notes:***

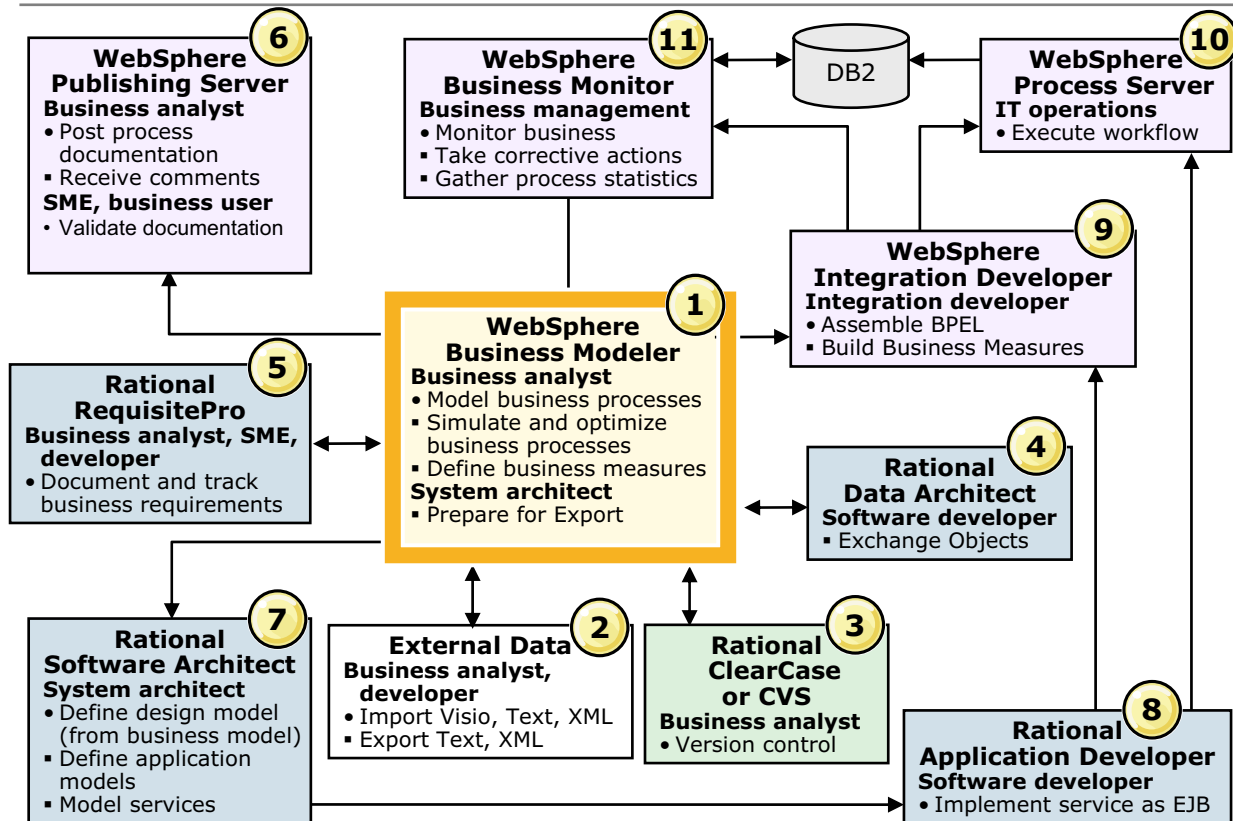
**Purpose** — .

**Details** —

**Additional information** —

**Transition statement** — Next: Modeler's relationship with other products covered in this course

## Modeler's relationship with other products covered in this course



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Figure 9-14. Modeler's relationship with other products covered in this course

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### Notes:

This slide shows the integration between WebSphere Business Modeler and other IBM and non-IBM products. The numbers on this slide do NOT represent a sequence of events.

1. A process model is built using existing information or future design information in WebSphere Business Modeler.
2. Supporting information can be imported (existing Visio models, business items, business services) to support the development of the model.
3. Versions of the process model are stored in a repository for security and control using Rational ClearCase or CVS.
4. Additional IT information can be imported from Rational Data Architect to support development.
5. Business requirements are synchronized with the process model using Rational RequisitePro.
6. Models are exported to WebSphere Publishing Server for review (using a Web browser) during development and later in production.



7. When the new process is ready for development, UML models for building new services are exported to Rational Software Architect.
8. Once the software design is done, the code is developed in Rational Application Developer and exported for further development and execution.
9. Workflow code is developed in WebSphere Integration Developer using the BPEL code generated from the model and using the WSDLs interfaces that were developed. The completed code is exported for execution and monitoring.
10. The workflow code is executed on WebSphere Process Server and production data is exported for monitoring and reporting.
11. Production data is monitored by management using WebSphere Business Monitor. Production data can be exported from WebSphere Business Monitor and imported into WebSphere Business Modeler for future analysis.

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —** Next: Additional materials in your class image

## Additional materials in your class image

---

- Clean lab workspaces
  - Lab workspaces that you can re-do your lab exercises
- Industry samples
  - Banking, Accounting and reporting, Human resources, Insurance, retails, product and services
- Six Sigma classifiers
  - Lean sigma classifiers
- Simple samples
  - Bank, medical, retail, telecommunication and simulation scenarios
- Spreadsheets
  - Data templates for business items

---

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Figure 9-15. Additional materials in your class image

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### **Notes:**

Additional materials located at C:\ drive in your class image

***Instructor notes:***

**Purpose** — .

**Details** —

**Additional information** —

**Transition statement** — Next: Unit summary

## Unit summary

---

Having completed this unit, you should be able to:

- Explain the key concepts that were covered in this course

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Figure 9-16. Unit summary

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### **Notes:**

***Instructor notes:***

**Purpose —**

**Details —**

**Additional information —**

**Transition statement —**

---

# Appendix B. List of abbreviations and acronyms

## A

## B

**BPC** Business Process Choreographer  
**BPEL** Business Process Execution Language  
**BPM** business process management  
**BPMN** Business Process Modeling Notation

## C

## D

## E

**EAR** enterprise archive  
**ECM** Enterprise Content Management  
**ESB** enterprise service bus

## F

**FDL** FlowMark Definition Language

## G

## H

**HTML** Hypertext Markup Language  
**HTTP** Hypertext Transfer Protocol

## I

**IDE** integrated development environment  
**IDL** Interface Definition Language  
**ISV** independent software vendor  
**IT** information technology

## J

**J2C** J2EE Connector Architecture  
**J2C** Java 2 Connector  
**J2EE** Java 2 Enterprise Edition  
**J2SE** Java 2 Standard Edition  
**JAR** Java archive  
**JVM** Java virtual machine

---

## **K**

**KPI** key performance indicator

## **L**

**LAN** local area network

**LDAP** Lightweight Directory Access Protocol

## **M**

## **N**

## **O**

## **P**

## **Q**

## **R**

## **S**

**SCA** Service Component Architecture

**SVG** Scalable Vector Graphics

## **T**

## **U**

**UML** Universal Modelling Language

## **V**

## **W**

**WAR** Web archive

**WSBPDL** Web Services Business Process Execution Language

**WSDL** Web Services Description Language

## **X**

**XDE** Extended Development Environment

**XML** Extensible Markup Language

**XPDL** XML Process Definition Language

**XSD** XML Schema Definition

**XSL** Extensible Stylesheet Language

**XSLT** Extensible Stylesheet Language Transformation



---

**Y**

**Z**





